CURRENT HOUSING RESEARCH

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SOCIAL, ECONOMIC AND TECHNICAL RESEARCH

CMHC SCHL

HOME TO CANADIANS
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INTRODUCTION

Welcome to "*Current Housing Research*". This publication merges "*Housing Research Quarterly*" and "*Current Housing Technology Initiatives*" and continues the numbering of the "Housing Research Quarterly".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced two to three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's web site at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC·S EXTERNAL RESEARCH PROGRAM

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7
Telephone: 613-748-2249
Fax: 613-748-2402
E-mail: erp@cmhc-schl.gc.ca

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TECHNICAL RESEARCH

ABORIGINAL HOUSING: LOCAL DESIGN AND MATERIAL

This project responds to opinion that house designs found in Aboriginal communities are inappropriate and that perfectly good building materials exist on reserve but are never used. The project assumes that in fact there are a significant number of examples where appropriate designs have been put in place and where the potential use of local material has been investigated. The project will identify these examples, and document a selected number of them as case studies. The case studies will produce material suitable for dissemination.

The general approach is:

- to build an inventory of past initiatives on increasing the Aboriginal relevance of housing design and on assessing the feasibility of using local materials,
- to select a range of examples from the inventory for case study analysis, and
- to draw conclusions along the lines of "lessons learned".

CMHC Project Officer : Phil Deacon — CIDN : N/A
Division : Research Division — STATUS : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

BUILDING COMMUNITIES: FIRST NATIONS BEST PRACTICES FOR HEALTHY HOUSING AND SUSTAINABLE COMMUNITY DEVELOPMENT

This publication focuses on proven alternative construction methods, materials and approaches to achieve sustainable Healthy Housing and community development. "Building Communities" outlines and explains new and efficient:

- Construction methods and materials.
- Cutting-edge technologies in electrical co-generation systems.
- Natural, or biological, sewage and waste water treatment systems.
- Alternative heat generation systems
- Innovative transportation systems that could reduce some of the problems providing construction products and materials to remote and fly-in communities.

"Building Communities" outlines the importance of planning to create an integrated approach to Healthy Housing and community and economic development. It illustrates and explains some examples of Healthy Housing systems. It gives the principles that CMHC uses for Healthy Housing and community development. It uses as examples:

- CMHC's Healthy House in Toronto.
- The Eagle Lake First Nation Northern Healthy House.
- The Roseau River First Nation Healthy House.
- The Mohawks of the Bay of Quinte R-2000 Homes.
- The Mohawk Community of Kahnawake proposed Healthy House and the community's long-term sustainable development planning strategy.
- The EcoNomad™ self-contaminated utilities unit.

Prepared by Morgan Green, Onkwehonwene Anishinabek Sustainable Integrated Systems. CMHC Project Officer: Alain Croteau. Ottawa: Canada Mortgage and Housing Corporation, c2001. 56 pages

Order number: 62317

Note: Aussi disponible en français sous le titre : Bâtissons ensemble : meilleures pratiques autochtones d'établissement de maisons saines et de collectivités durables

STATUS : New Completed Report
AVAILABILITY : CMHC Information Products

COST-EFFECTIVE INDOOR AIR QUALITY AND ENERGY EFFICIENCY RECOMMENDATIONS FOR FIRST NATIONS HOUSING

The purpose of this research project was:

-- to prove that less capital investment in First Nations housing but acceptance of higher costs incurred over the life cycle of a house is not cost-effective;-- to demonstrate the potential for cost-effective, improved housing in First Nations communities; and-- to demonstrate the value of investigations according to the CMHC Indoor Air Quality Investigative Protocol and the Energuide for Houses Evaluation Protocol as repeatable, effective renovation planning methods that could be implemented by First Nations technical service providers.

Indoor air quality investigations and house energy efficiency evaluations, according to the recognized protocols noted above, were conducted on five sample houses volunteered by the Washagamis Bay Fist Nation.

The research found that the sample of First Nations houses that were investigated were built with low capital expenditure which in the long run compromised the indoor air quality and durability of the houses as well as increased the maintenance costs. The study showed that it is cost effective to implement energy saving strategies at the same time as improving the indoor air quality of the homes.

Prepared by Bill Boles. CMHC Project Officer: Virginia Salares. Ottawa: Canada Mortgage and Housing Corporation, 2001 (External Research Program)

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE

This project is being undertaken in partnership with First Nations communities. The objectives are to support the design, construction and demonstration of five on-reserve Healthy Houses near Montreal, Belleville, Thunder Bay, Winnipeg, and on band land in N'Dilo and Dettah near Yellowknife. To date, four houses have been built and demonstrated in the following communities - Kanawake QC, Eagle Lake ON, Roseau River MB, plus several micro-sewage treatment systems in NT. Native communities own and occupy these demonstration houses, which were constructed by locally trained trades and specialists. A goal of the project was to better equip First Nations community and other decision makers, and the public to understand the importance of constructing more affordable, appropriate and environmentally sustainable housing. A CMHC report will be produced detailing house costs and benefits, designs and systems at the completion of the project. An About Your House summary has already been published which describes the Eagle Lake Healthy House and its matching "EcoNomad" utilities container. A 30 minute video has also been prepared which describes the Kanawake Healthy House and their plans to build a "sustainable subdivision" of 27-35 homes on a ten acre "ecovillage" site. The Tyendinaga Mohawks (near Belleville ON) have already built four Granny Houses and five Seniors homes which meet Healthy Housing IAQ goals (Indoor Air Quality). This community is now preparing to design and build a "sustainable subdivision" of some 36 homes, not just one demonstration Healthy House. The N'Dilo and Dettah communities have installed micro-sewage systems in several homes, following the demonstration and testing of a prototype micro-system in a single family house. The performance of these micro-systems is now being monitored in collaboration with the NT Housing Corporation.

CMHC Project Officer : *Chris Ives* ***CIDN*** :
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

**** SEE ALSO:** p. 77-81 and Mold in Housing: An Information Kit for First Nation Communities, p. 56.

ACOUSTICS

SUMMARY REPORT FOR CONSORTIUM ON FIRE RESISTANCE AND SOUND INSULATION OF FLOORS: SOUND TRANSMISSION CLASS AND IMPACT INSULATION CLASS RESULTS

The IRC Acoustics Laboratory has completed the measurement phase of a study of airborne and impact sound transmission through typical floor constructions used in Canadian housing. As well as the Institute for Research in Construction (IRC) of the National Research Council of Canada, this project was supported by a consortium of some 18 different organizations and government departments, including Canada Mortgage and Housing Corporation and the Canadian Home Builders" Association. This report presents the sound transmission class (STC) and impact insulation class (IIC) ratings for all the floors in the project. Some of the specimens were chosen by IRC for technical reasons, but the majority of the specimens were approved as part of a structured series established collectively by the consortium. The acoustical measurements included impact sound measurements using experimental, non-standard devices. These measurements were made to provide extra information that might be used to improve the existing standardized tapping machine test or to develop new test procedures. A further IRC report will deal with these experimental impact measurements in detail. The combined set of over 190 specimens provides:-- data for systematic evaluation of sound transmission through joist floor systems;-- data for development of prediction methods;-- data for development of improved constructions; and-- a consistent assembly of sound transmission class and impact insulation class data needed by builders and regulators to select constructions suitable for party floors in multi-family dwellings.

Prepared by A.C.C. Warnock and J.A. Birta, Institute for Research in Construction, National Research Council Canada. Ottawa: Canada Mortgage and Housing Corporation, 2001, c1998. xiv, 121 pages

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

BASEMENTS, FOUNDATIONS & CRAWLSPACES

COMPREHENSIVE STUDY ON SLAB-ON-GRADE FOUNDATIONS

The purpose of this project is to investigate and provide answers to technical questions on slab-on-grade insulation, moisture protection, and heating systems appropriate to be used with such a foundation type, and cost effectiveness in various climate regions of Canada. Other aspects to be studied will be: consumer acceptance of this type of "basementless" house; alternate layout designs to accommodate storage; overall pros and cons of the alternative house foundation type.

CMHC Project Officer : *Ken Ruest*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2275 0200
STATUS : Planned

INSULATED CONCRETE FORMS TRAINING PROGRAM

This is a multi-partnered project with members including: Cement Association of Canada (CAC), Portland Cement Association (PCA), Insulating Concrete Form Association (ICFA), National Energy Conservation Association (NECA), Alliance of Canadian Building Officials Association (ACBOA), Association of Canadian Community Colleges (ACCC), Seneca College, Southern Alberta Institute of Technology (SAIT), Atlantic Home Builders' Training Board (AHBTB), Canadian Carpentry Union, CHBA, NRCan and CMHC. The CAC is managing the project on behalf of the partners. The purpose of this project is to develop and pilot a course curriculum and course training materials on how to properly construct insulated form foundation and building systems (ICFs). The course will consist of two modules; Introduction to Insulated Concrete Form Construction, and Fundamentals of Concrete Footings and Foundations. It will be promoted to ICF installers, home builders, home inspectors, building officials, and the trades involved in the installation of ICFs. The course will be developed and piloted in two phases over a two year period from 2000 to 2002 and the third phase will be implementation of the training program into various educational institutions across the country in 2002-2003.

CMHC Project Officer : *Darrel Smith* — ***CIDN*** : 2411 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS

CMHC is a participant contributing research to this multi-disciplinary, multi-agency study led by the National Research Council identifying knowledge gaps in the performance of basement systems. Guidelines are being developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Field work is complete. Guidelines are being drafted. CMHC will look into ways to inform builders and the public about better basement designs.

CMHC Project Officer : *Don Fugler* — ***CIDN*** : 1421 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

PRACTICAL MEASURES FOR THE PREVENTION OF BASEMENT FLOODING DUE TO MUNICIPAL SEWER SURCHARGE

This External Research Program (ERP) project is to study practical measures currently available to homeowners experiencing basement flooding problems, and builders constructing new homes within sewer surcharge-prone areas.

CMHC Project Officer : *Don Fugler* — ***CIDN*** : 2437 0200010
Division : External Research Program — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

BASEMENTS, FOUNDATIONS & CRAWLSPACES

UNDERSTANDING AND DEALING WITH INTERACTIONS BETWEEN TREES, SENSITIVE CLAY SOILS AND FOUNDATIONS. ABOUT YOUR HOUSE; CE31

This About Your House publication provides background information and advice on understanding and dealing with interactions between trees, sensitive clay soils and foundation problems. It describes where these soils exist, the impact of soil shrinkage on foundations and the potential role of trees in soil shrinkage. It provides a summary of some of the important factors related to soil shrinkage and foundation stability, as well as tips for managing a tree's contribution to foundation damage.

Ottawa: Canada Mortgage and Housing Corporation, 2001. (About Your House; CE31) 8 pages

NOTE : Aussi disponible en français sous le titre : Comprendre l'interaction des arbres, du sol d'argile sensible et des fondations et agir en conséquence

STATUS : New Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on CMHC's Web site. To download this document visit CMHC's Web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

↔ SEE ALSO: - Residential Foundation Systems for Permafrost Regions, p. 60
- Improvements to the Moisture Performance of Preserved Wood Foundations, p. 56
- Innovative Foundations, Heating & Ventilation, p. 58

BUILDING CODES

PROJECT TO PROMOTE IMPLEMENTATION OF THE NATIONAL BUILDING CODE AND A STANDARDIZED BUILDING PERMIT IN PRINCE EDWARD ISLAND: THE HOME BUILDERS' ASSOCIATION OF PRINCE EDWARD ISLAND = PROJET VISANT À PROMOUVOIR L'ADOPTION DU CODE NATIONAL DU BÂTIMENT ET D'UNE FORMULE UNIFORMISÉE DE DEMANDE DE PERMIS DE CONSTRUIRE À L'ÎLE-DU-PRINCE-ÉDOUARD : HOME BUILDERS' ASSOCIATION OF PRINCE EDWARD ISLAND

This case study report describes the work in 1998 of the P.E.I. Home Builders' Association to persuade municipal and provincial authorities to adopt the National Building Code and to implement a uniform building and development permit application form. Of the 89 municipalities in Prince Edward Island, only two, Charlottetown and Summerside, apply and enforce the NBC. There is also no building code enforcement in unincorporated areas of the province. The study outlines the arguments in favour of adoption, including consumer protection, safety, financial and industry issues and the impacts on affordability, choice and quality. The standardized permit application form developed by the P.E.I. Home Builders Association is included as an appendix.

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 36 pages

Order Number: 62001

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

BUILDING CODES

REWRITING TEST STANDARD CAN/CGSB-149.10 - DETERMINATION OF THE AIRTIGHTNESS OF BUILDING ENVELOPES BY THE FAN DEPRESSURIZATION METHOD

The airtightness standard used for testing houses dates back to 1986. The object of this project is to re-write CAN/CGSB-149.10, incorporating some updates and some alternative techniques. There have been no meetings up until now but there has been extensive consultation by e-mail and document review. Progress has been delayed due to the lack of consensus by committee members. The contractor who assembled the new draft of the document is looking into modifications of the text to satisfy some of the objections.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1971 0200002
STATUS : Ongoing

ROLE OF CONSTRUCTION CODES IN THE CANADIAN BUILDING SYSTEM

The purpose of this joint venture project with NRC and CHBA is to develop two papers which will help in the understanding of the changes to the Model National Codes which are occurring as a result of efforts currently underway to clarify the objectives of these codes and move them to being Objective-Based. The first paper is entitled "Canada's Construction System and the Context for Model Codes". It presents an overview of the system of construction in Canada and the role of Model Codes in that system. The second paper describes the value and benefits of Objective-Based Codes to residential builders and renovators. The papers have been published by NRC.

STATUS : Completed report
AVAILABILITY : On the Internet: http://www.ccbfc.org/ccbfc/tgs/obc/docs/

BUILDING MATERIALS

PERFORMANCE OF PLASTIC AND COMPOSITE MASONRY TIES

The objective of this project is to investigate the possibility of using alternative materials (plastics or composites) in the fabrication of masonry ties. Detailed research will be undertaken to determine what has been done in the field of masonry ties around the world. The information received will be reviewed with respect to the appropriateness of plastic or composite masonry ties for masonry construction and the opportunities they represent.

CMHC Project Officer : *Luis de Miguel*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2144 0200020
STATUS : Ongoing

SEISMIC PERFORMANCE OF RAINSCREEN STUCCO

This comprehensive study on the earthquake resistance of different stucco wall systems is underway at the University of British Columbia and includes an extensive test series to determine the strength of different stucco types, static cyclic tests of single wall specimens, the analytical modeling of wall systems with stucco, and the dynamic testing of entire wall systems, leading to design recommendations for engineers and architects.

CMHC Project Officer : *Silvio Plescia* ***CIDN*** : 2480 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

SERVICE LIFE OF MULTI-UNIT RESIDENTIAL BUILDING ELEMENTS AND EQUIPMENT

Maintaining Canada's housing stock requires timely investment of funds for replacement of building elements and equipment. CMHC engaged IBI Group to survey experienced building professionals across Canada to obtain real life, non-theoretical estimates of service life for over 230 components in apartment buildings over five storeys high. The information was collected through a three-stage survey and analysis process resulting in an average high-end and low-end estimate of service life for each building item. The resulting range was then divided into approximately equal three sub-ranges: below average, average and above average length of service life. Using a model building, costs were developed based on specific assumptions for length of building life, inflation rate for construction and discount rate. This information produced a range of annual contribution amounts necessary to maintain the reserve fund. This report summarizes the study, lists the results and describes a process to make immediate use of the information.

A generic reserve fund cash flow model has been prepared as part of this project. You may obtain a copy of the Excel spreadsheet from the following URL address:

ftp://ftp.cmhc-schl.gc.ca/servicelife

Prepared by IBI Group. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2000. (Housing Technology Series) 68 pages

Order Number: 62280

Note : Aussi disponible en français sous le titre : La Durée de vie utile des matériaux et équipements techniques des édifices résidentiels de moyenne et grande hauteur

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

VIRTUAL SAMPLE ROOM WEB SITE OF GREEN BUILDING MATERIALS - PHASE II

The Virtual Sample Room is a web site that provides information for designers, builders, renovators, and consumers on building materials that are environmentally responsible and/or minimize indoor air pollution. The site was developed and continues to be owned by a consortium of federal government departments and municipalities. The purpose of this Phase II project was to expand the number of product listings from the original 200, and to improve the promotion of the site. The site now includes approximately 750 product listings, covering almost all areas of construction, and is being promoted by the various partners. The site has a new URL and will be "re-launched" later in 2001. The site is now active and can be visited at http://www.designinggreen.com/.

STATUS : Completed Report
AVAILABILITY : On the Internet: http://www.designinggreen.com/.

CONCRETE

BEST PRACTICE GUIDE FOR PRE-CAST CONCRETE WALLS

The objective of this project is to develop a practical, advisory document for designers, architects and engineers, and manufacturers, related to precast wall panels in residential applications. Precast is a well developed system in commercial applications but it requires special treatment when used in housing. The project will be conducted in partnership with the Canadian Precast and Prestressed Concrete Institute, installers and their associations. This Guide will be produced as a joint publication through a collaborative project with Public Works Government Services Canada. The Guide, produced in hard copy and CD-ROM format, will address: pertinent building science with emphasis given to aspects particular to precast walls, construction details in AutoCAD format, outline specifications and additional sources of information and references. The anticipated release date for the product is April 2002.

CMHC Project Officer : *Luis de Miguel*
CIDN : 2215 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (e.g. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer : *Silvio Plescia*
CIDN : 1890 0200002
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments. Two of the three case studies are complete: a potential soil gas movement problem in a Vancouver high-rise and heavy metals moving from fill in the vicinity of Wells, BC. A third potential location has been identified in the Yukon. Testing will have to follow construction of the houses, which may not take place until 2002.

CMHC Project Officer : *Don Fugler*
CIDN : 1946 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

DOORS AND WINDOWS

LEAK-PROOFING WINDOWS, PHASE I - FABRICATION, INSTALLATION AND MAINTENANCE

The Survey of Building Envelope Failures in the Coastal Climate of British Columbia revealed that exterior moisture penetration through and/or around windows (at window wall interfaces) is a significant contributor to the envelope moisture problem. The objective of this project is to undertake a study which identifies the nature and causes of moisture ingress problems associated with windows and window to wall interfaces. The study will identify and recommend solutions for addressing water penetration problems associated with all aspects of the window manufacturing, design, installation and in-service maintenance. This work is underway and is anticipated to be completed by the end of 2001.

CMHC Project Officer : *Silvio Plescia*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2285 0200001
STATUS : Ongoing

LEAK-PROOFING WINDOWS, PHASE II- WINDOW CODES, STANDARDS, TESTING, CERTIFICATION AND HARMONIZATION

This project's objectives are to undertake a study to review the CSA A440 standard (including all its attachments), window testing standards and protocols, the window certification process and the potential impact of harmonizing the A440 standard with the North American Fenestration Standard. The purpose is to identify those requirements related to the moisture penetration problems through and around window assemblies, into the building envelope of low rise (up to 4 storeys) wood-framed residential buildings.

CMHC Project Officer : *Silvio Plescia*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2425 0200001
STATUS : Ongoing

ENERGY CONSERVATION

AIR LEAKAGE CHARACTERISTICS, TEST METHODS AND SPECIFICATIONS FOR LARGE BUILDINGS

CMHC recently completed a survey of published air leakage data for multi-unit residential and large commercial buildings. The objective of the study was to compile air leakage data for large buildings, identify air leakage test methods, performance targets and the availability of specifications and quality control procedures to reduce air leakage in large buildings. The results of the review show that virtually all large buildings, both new and old, are quite leaky when compared to recommendations contained within the Appendices of the 1995 National Building Code of Canada. Measured air leakage levels range from 10 to 50 times recommended levels. Despite this, there have been several building projects that have demonstrated that air leakage can be significantly reduced when proper building air barrier details are designed and installed, and where quality assurance measures are in place. The information provided by this project serves to baseline the current performance of air barrier systems in conventional large buildings and also shows what levels of performance are possible with better design, construction, testing and commissioning methods. The project report will serve as an important reference document as efforts move forward to improve the quality of building envelope systems.

Prepared by Gary Proskiw, Proskiw Engineering Ltd. and Bert Phillips, Unies Ltd. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2001. 85 pages

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

ALTERNATIVE HOME ENERGY SOURCES FOR THE NORTH

This is a partnership project between Alaska Housing Finance Corporation, Arctic Energy Alliance and CMHC. Access to alternate energy in the North was an important issue identified in the 1998 Client Consultation. While much literature exists on alternative home energy sources, most of it is too complex for general comprehension. Further, much of this information has not been verified for applicability to the North including availability and performance of alternative energy products in the North. This project will provide a full summation of options, a cost benefit analysis based upon present individual utility infrastructures and costs as well as regional climatic requirements, reference and contact information.

CMHC Project Officer : *Aleta Fowler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2312 0200003
STATUS : Ongoing

ANALYSIS OF THE IMPACT OF ENERGY EFFICIENCY MEASURES IN MULTI-UNIT RESIDENTIAL BUILDINGS

An energy and greenhouse gas emission simulator will be developed to model the impacts of energy efficiency measures on large buildings. The energy simulator will be capable of analyzing the impact of individual, or packages of, energy efficiency measures on the energy consumption and green house gas emissions of large commercial and multi-unit residential buildings. Regional and national energy and green house gas emission reductions will be assessed by using the simulator to evaluate the impact of energy efficiency measures on the buildings in a representative building database. The results of the analysis will then be projected to national levels to determine the extent of retrofit measures that are required within the building stock to meet the reduction targets set by the Kyoto Protocol in December 1997.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2249 0200001
STATUS : Ongoing

CASE STUDIES OF MAJOR HOME ENERGY RETROFITS

To meet targets for greenhouse gas production in Canada, the residential sector will have to significantly reduce energy consumption in existing houses. A 1995 CMHC report suggested that houses built prior to 1989 will have to reduce energy consumption on average by about 40%. This is a big reduction, one that is rarely realized in programs funded by government or the utilities. The object of this research is to see whether four or more relatively normal houses can have their total energy usage reduced by 40%. Saskatchewan Research Council has been hired to determine this. The houses have been selected and the retrofits contracted by the owner should be completed by fall 2001. Monitoring for the next year will establish whether the 40 % goal can be achieved.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2349 0200001
STATUS : Ongoing

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of this first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing. The case studies currently underway include:

1. Conservation Co-op, Ottawa
2. Dual Fuel Heating System, Oshawa
3. Energy Efficiency Retrofit of an Apartment Building, Toronto
4. Case Studies of Interior Insulation Retrofits in Buildings with Solid Masonry Walls (CMHC "A" Building, Ottawa; Lofts Corticelli, Montréal; Karcher Building, Prince Albert)
5. The Complete Rehabilitation of the Broadview Apartment building.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 1899 0200002-3
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing (OMMAH), is in the process of developing a manual that details energy and water efficiency measures for existing multi-unit residential buildings. The document will be based on a manual originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A web-based version of the manual is being developed that will be installed on the CMHC web-site. Individual energy and water efficiency measures are being placed on the high-rise group website as they are developed. The measures are being publicized as the energy and water efficiency "Tip of the Week" (http:// www.cmhc-schl.gc.ca/ en/imquaf/himu/wacon/ waensatip/ index. cfm). The production of the web-based and translated version has also allowed for a simultaneous final editing of the manual in preparation for publication.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 1887 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

ENERGY USE PATTERNS IN OFF-GRID HOUSES

To consider opportunities to reduce greenhouse gas, a contractor surveyed twelve households across Canada which have been 'off the grid' for at least two years, with a focus on renewable energy sources such as solar, wind, and micro/minihydro. The contractor documented energy use and lifestyle patterns that accommodated the limits of off-grid electrical production. The objective was to provide examples of approaches relevant to mainstream housing. The field work is complete and the report is available as a research highlight on the CMHC website. There were no consistent energy saving measures that emerged from the research which are particularly suitable for mainstream houses. The report is useful however as a illustration of the variety of approaches used for offgrid housing and the range of energy consumption patterns in housing.

Research Consultant: Shawna Henderson, Abri Sustainable Design. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2001. (Research Highlights; Technical Series: 01-103) 24 pages

NOTE : Aussi disponible en français sous le titre : Consommation d'énergie dans les maisons hors réseau

STATUS : Completed Research Highlight
AVAILABILITY : CMHC Information Products and available on the CMHC web site

FINANCIAL TOOLS FOR CO2 REDUCTION

This project responds to Canada's planned Kyoto commitment to take actions that will help reduce CO2 emissions. It aims to identify financial mechanisms that can encourage and accelerate the adoption of energy efficiency measures for existing and new housing. It will survey financial mechanisms that have been used in Canada and abroad and evaluate their potential for take up and energy use reduction. It will examine in more depth six initiatives and draw from them lessons that would apply to Canada's conditions. It will subsequently examine a number of initiatives for further consideration re: potential adoption and/or adaptation in Canada.

CMHC Project Officer : *Fanis Grammenos*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2281 0200001
STATUS : Ongoing

LOW-TEMPERATURE HYDRONIC HEATING AND HIGH-TEMPERATURE COOLING: A CANADIAN OPTION FOR MORE SUSTAINABLE BUILDINGS

Residential and commercial buildings account for about 32% of secondary energy use in Canada, and for over 29% of greenhouse gas emissions. Space and water heating and space cooling needs account for over 80% of residential energy use and 70% of commercial energy use.

There are numerous approaches and technologies that can contribute to more sustainable buildings and communities. This report investigates a specific technical and philosophic approach to building energy use: the use of low-grade energy sources, low- temperature heating systems, and low-temperature cooling systems. The report outlines technical features, applications, benefits, opportunities, and obstacles associated with such systems.

Prepared by Katherine Arkay Consulting. CMHC Project Officer: Ken Ruest. Prepared for Research Division, Canada Mortgage and Housing Corporation and Natural Resources Canada. Ottawa: Canada Mortgage and Housing Corporation, 2000. 2 volumes
Volume 1: Project Report (150 pages)
Volume 2: Consultation Process Results (47 pages)

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

OPTIMIZING HEAT AND AIR DISTRIBUTION SYSTEMS WHEN RETROFITTING HOUSES FOR ENERGY EFFICIENCY

When a house undergoes energy upgrading, either by improving the envelope or the heating appliance, one factor often overlooked is the heating or ventilating distribution system. With support from the Program for Energy Research and Development (PERD), CMHC will be undertaking research into distribution system upgrades, probably in conjunction with other federal agencies. The first stage of this work is a review of the performance characteristics of current and innovative distribution systems. The review will establish the operating characteristics of HVAC equipment and distribution systems. This includes both old, existing systems; current, off-the-shelf components; and new distribution systems coming on the market. As well, this review identifies problems with the integration of upgraded heating or cooling systems and existing energy distribution systems in houses. The output of this project will help guide the next phases of the work: laboratory studies, field studies, and demonstrations. A draft report on the literature review has been submitted and has been circulated for comment.

CMHC Project Officer : *Don Fugler* ***CIDN*** : 2440 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

RETROFITTING A CITY - LESSONS FROM TORONTO'S BETTER BUILDINGS PARTNERSHIP PROGRAM

The primary goal of this project is to help municipalities across North America improve energy efficiency in buildings and reduce their greenhouse gas emissions. Based on Toronto's successful Better Buildings Partnership Program the project will produce a useable manual for designing and implementing municipal building retrofit programs to improve water and energy efficiency. Building retrofits can reduce greenhouse gas emissions by lowering energy consumption. Undertaken on a wide scale, retrofitting buildings can enhance the sustainability of urban centres by diminishing air pollution locally and slowing the rate of consumption of natural resources.

CMHC Project Officer : *Brian Eames* ***CIDN*** : 2355 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

SURVEY OF MULTI-UNIT RESIDENTIAL BUILDING CHARACTERISTICS AND ENERGY USE DATA

This project involves the collection of the physical and operational characteristics of 40 multi-unit residential buildings from all regions in Canada. Energy and water consumption histories for the past 2 to 3 years have also been collected for each building. The survey portion of this work is now complete. CMHC is in the process of developing a database to store the building files and to allow for the comparison of energy and water usage given building age, size, region, fuel type and occupancy. The building files will also be used in combination with an energy simulator-green house gas estimator to estimate the impact of upgrading the stock of multi-unit residential buildings in Canada. It is envisioned that the database will be supplemented with additional buildings that CMHC will access in the course of other research projects.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 2249 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

ENERGY CONSERVATION

UPDATING THE AIRTIGHTNESS TESTING STANDARD

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC engaged a contractor to undertake this work in 1998/99. The new draft standard was balloted in the winter of 2000. Reviews and comments are currently being evaluated.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1971 0200001
STATUS : Ongoing

FIRES & FIRE PREVENTION

CLEANING UP YOUR HOUSE AFTER A FIRE

After a Fire is a consumer publication being prepared to help homeowners deal with fire damage in their homes. This publication will explain the issues to be considered to restore the home and to ensure a safe, healthy environment for the occupants. It is intended to be a brief publication targeted to the consumer, but it will also be useful to fire departments, restoration contractors, and insurance companies.

CMHC Project Officer : *Ken Ruest*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2298 0200001
STATUS : Ongoing

INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION

A research project has been initiated to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Preliminary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, lower cost, life and property saving tool.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1983 0200002
STATUS : Ongoing

ASSESSING THE PARAMETERS FOR VENTILATION SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS

This research project will determine the ventilation requirements for apartments. Equipment and systems will be evaluated in their ability to meet such requirements in the context of building design, occupancy type and recent experiences in the application of ventilation systems in multi-unit residential buildings. Design and installation recommendations will be created for use by building designers. Technology gaps (e.g.; the absence of appropriate equipment) will also be identified for the benefit of future research and development efforts.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2271 0200001
STATUS : Ongoing

ASSESSMENT AND ALTERNATIVE APPROACHES FOR VENTILATION SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS

The purpose of this project is to conduct a literature review, needs assessment and alternative approaches for ventilation systems in multi-unit residential buildings.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2271 0200001
STATUS : Ongoing
*** NEW ***

CHARACTERIZATION OF AIR LEAKAGE, PRESSURE REGIMES AND RESULTANT AIR MOVEMENT IN HIGH-RISE RESIDENTIAL BUILDINGS

The objective of this project is to undertake a field investigation of the ventilation and infiltration in a residential high-rise building. CMHC, in cooperation with the Institute of Research in Construction, will monitor indoor-outdoor air pressure regimes in a high-rise for a period of one year. Ventilation system performance will also be assessed. Pressure regime measurements, in conjunction with measured air leakage characteristics of selected assemblies, will be used to estimate real-time air movement across the building envelope. This information will add to the body of knowledge governing infiltration-ventilation regimes and resultant heat load calculations in buildings.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1934 0200005
STATUS : Ongoing

CMHC GARBAGE BAG AIRFLOW TEST. ABOUT YOUR HOUSE; CE33

It is difficult for householders or small contractors to estimate airflows in the home. Suitable measuring equipment is not available for householder's use and the airflow test equipment available for contractors is relatively expensive and unwieldy. One alternative test method is to time the inflation of a garbage bag to estimate duct flow. The flow vs time characteristic was approximately established by CMHC research over ten years ago. This research has refined and extended the garbage bag air flow test procedure. This About Your House document has been prepared on how to do the test. The test, while somewhat crude, is a good indicator of flow for both householders and contractors.

Ottawa: Canada Mortgage and Housing Corporation, 2001. 2 pages.

Order Number: 62288

STATUS : Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on the Internet: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

DAWSON CITY DEMONSTRATION PROJECT - MONITORING

The objective of this project is to evaluate the state of the mechanical and monitoring system, conduct an on-site inspection in Dawson City and develop a proposal for monitoring and analysing the system's performance. Two houses were monitored over the past two heating seasons and the operating data is being analyzed.

CMHC Project Officer : *Mark Holzman*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1676 0300005
STATUS : Ongoing

FIELD TESTING OF A POSITIVE PRESSURE VENTILATION DEVICE

A Positive Pressure Ventilation device, commonly used by fire departments for smoke control during fire emergencies, will be used to test the pressure and flow generating characteristics of the PPV fan system when used to pressurize a stairwell in a multi-unit residential building. The purposes of the test are twofold. First, the test will confirm the ability of the PPV equipment to generate sufficient pressures within the stairwell of an actual multi-unit residential building to prevent the proliferation of smoke into the stairwell from adjacent corridors. Second, the test will assess the ability of the PPV equipment to generate sufficient pressures to allow the equipment to be used for the purpose of determining air leakage characteristics of large buildings.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1983 0200003
STATUS : Ongoing
*** NEW ***

FIELD TESTS OF VENTILATION SYSTEMS INSTALLED TO MEET THE 1993 OBC AND 1995 NBC

This research looked at 49 new houses which had ventilation systems installed to meet the requirements of the 1995 National Building Code (as adopted by various provinces) or the 1993 Ontario Building Code. None of the houses met all the code requirements. The lack of compliance in Ontario and the Maritimes was due to equipment selection and installation that varied from code requirements. The Prairie houses also showed very high levels of potential house depressurization, which could lead to dangerous backdrafting and spillage of combustion appliances. Results from the 49 houses were outlined in the CMHC Research Highlight: Technical Series, no. 00-106. Since the field tests, there have been several attempts to propose changes to the National Building Code ventilation requirements, to avoid the problems identified in the survey, and a consensus was achieved in the spring of 2001. More field research is underway. Ten new Prairie houses will be built to the newly drafted code clauses in the fall of 2001. Testing will show whether the new clauses and the contractors interpretation of them leads to improved house ventilation.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : N/A
STATUS : Ongoing
* NEW *

NORTHERN HEATING AND VENTILATION SYSTEMS

This is a continuation of related CMHC research which is of particular need to the North. Adequate, appropriate and affordable means of ventilation and verification of manufacturers' claims need to be assessed using established CMHC methodology. Results will be critical in alleviating costly health and building damage due to lack of confirmed ventilation options. The report will be complete in 2002.

CMHC Project Officer : *Aleta Fowler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2420 0200001
STATUS : Ongoing

PERFORMANCE ASSESSMENT OF THE LEBRETON FLATS DISTRICT HEATING SYSTEM

The Lebreton Flats district heating system, installed 20 years ago, is one of few examples of low temperature district heating systems in North America. The availability of fuel consumption and maintenance records for the system allowed for an assessment of the performance of the system over the last 20 year period. Preliminary indications reveal that the plant provides space heating and hot water at a cost competitive with individual building systems but without the requisite building space. The distribution system was considered to be in good condition as minimal heat losses were noted. Recommendations regarding system performance, potential upgrades and future operation, maintenance needs and other ownership/management arrangements will be made in the final report.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2134 0200001
STATUS : Ongoing

HEATING AND VENTILATION

REDUCTION OF AIR INTAKE CONTAMINATION OF HIGH-RISE RESIDENTIAL BUILDINGS

In the study, entitled, 'Reduction of Air Intake Contamination of High-Rise Residential Buildings', buildings will be tested to determine optimal placement of air intake grilles for HVAC systems. The placement determination will be based on water flume tests and modeling of air movement around high-rise buildings given confounding factors such as the height and proximity of neighboring buildings. A literature survey of relevant research on air intake grille location and contamination potential will also be performed.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 2305 0200009
Division : External Research Program ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

THERMOSTAT SETTINGS IN HOUSES WITH IN-FLOOR HEATING

This project surveyed 50 homes with hydronic in-floor heating and 25 control homes to determine if houses with in-floor heating have lower thermostat settings than those of houses with other types of heating systems. Lower home temperatures would reduce energy consumption. Sales literature for hydronic heating sometimes makes this claim. The field work revealed that houses with in-floor hydronic heating have thermostat settings similar to houses with other heating systems, and that there are no energy savings that can be attributed to lower thermostat settings for hydronic in-floor heating.

Contractor: Jennifer Foote. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2001. (Research Highlights; Technical Series: 01-106) 2 pages

NOTE : Aussi disponible en français sous le titre : Réglage du thermostat dans les maisons dotées d'un plancher chauffant

STATUS : New Completed Research Highlight
AVAILABILITY : CMHC Information Products and available on CMHC's web site

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. Construction details for fire and sound assemblies will be detailed. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer : *Ken Ruest* ***CIDN*** : 1804 0200003
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

BEST PRACTICE GUIDE - WOOD FRAME ENVELOPES IN COASTAL CLIMATES OF BRITISH COLUMBIA

This project is revising the best practice guide - wood frame envelopes in coastal climates of British Columbia. A steering committee has been formed to recommend and evaluate the changes to the best practice guide. A consultant has also been retained to draft the changes. The changes have been received and have been circulated to the steering committee for approval. The new edition is now in production.

CMHC Project Officer : *Jacques F Rousseau* ***CIDN*** : 2378 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

BEST PRACTICE GUIDE FOR CURTAIN WALLS

The objective of this project is to develop a practical, advisory document for designers, architects and engineers, and manufacturers, related to curtain wall systems in housing applications. The curtain-wall is a well developed system in commercial applications but it requires special treatment when used in housing. The project will be conducted in partnership with curtain wall manufacturers and installers and their associations. This Guide will be produced as a joint publication through a collaborative project with Public Works Government Services Canada. The Guide, produced in hard copy and CD-ROM format, will address: pertinent building science with emphasis given to aspects particular to curtain walls, construction details in AutoCAD format, outline specifications and additional sources of information and references. The anticipated release date for the product is October 2002.

CMHC Project Officer : *Luis de Miguel* ***CIDN*** : 2216 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

BEST PRACTICE GUIDE FOR EXTERIOR INSULATED FINISHED SYSTEMS (EIFS)

The objective of this project is to develop a practical, advisory document for designers, architects and engineers, and manufacturers, related to EIFS in residential applications. The project will be conducted in partnership with EIFS manufacturers and installers and their associations. This Guide will be produced as a joint publication through a collaborative project with the EIFS Council of Canada and the BC Wall and Ceiling Association. The Guide, produced in hard copy and CD-ROM format, will address: pertinent building science with emphasis given to aspects particular to EIFS, construction details in AutoCAD format, outline specifications and additional sources of information and references. Anticipated release date is October 2002.

CMHC Project Officer : *Luis de Miguel* ***CIDN*** : 2047 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

BETH PROJECT: A BUILDING ENVELOPE TEST HUT IN COASTAL BRITISH COLUMBIA: FEASIBILITY STUDY

A study was performed to determine the feasibility of an outdoor test facility for building envelope materials and components in Vancouver. Test facilities are useful for real-time, real-weather performance assessment of construction materials and assemblies. There are several such facilities in use around the world but none in a climate comparable to that of coastal British Columbia. The feasibility study included a review of existing similar facilities, determination of criteria for a successful Vancouver facility, investigation into research grant opportunities for funding the facility's construction, development of a conceptual design for the facility and its experimental capabilities in order to determine a cost target for fundraising, sampling of a pool of potential paying users of the facility, identification of possible sites and project custodians, and development of a project development plan. The study of Phase 1 of this work indicated that the concept for a Vancouver test facility is viable enough to warrant movement into the next phase of project development: handover to a project development team and initiation of fundraising. Phase 2 is underway.

Prepared by Forintek Canada Corp. Prepared for Canada Mortgage and Housing Corporation and Homeowner Protection Office. CMHC Project Officer: Silvio Plescia. Ottawa: Canada Mortgage and Housing Corporation; Vancouver: Homeowner Protection Office, 2001. 49 pages

STATUS : New Completed Report

AVAILABILITY : On Loan from the Canadian Housing Information Centre

BETTER BUILDING GUIDE TO INNOVATION IN THE DESIGN AND CONSTRUCTION OF HIGH-RISE RESIDENTIAL BUILDINGS

The objective of this project was to coordinate and edit the work relating to updating the "Better Building Guide to Innovation in the Design and Construction of High-Rise Residential Buildings" and to update the text, references and illustrations. The guide is designed for architects and other building design professionals.

CMHC Project Officer : *Sandra Marshall* ***CIDN*** : 0840 0306020

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

BREEAM GREEN LEAF ECO-RATING PROGRAM: CMHC MULTI-RESIDENTIAL BUILDINGS ASSESSMENT PILOT: FINAL REPORT

There are many reasons for measuring the environmental performance of buildings, chief among them being that it can help building owners decide where to put their retrofit dollars to improve their buildings and reduce operating costs.

BREEAM/Green Leaf is an environmental assessment protocol that was developed in response to the need in the marketplace for a less expensive methodology that could be partially conducted in-house. This makes it an appropriate introductory whole-building, comprehensive energy and environmental assessment for managers of multi-residential buildings. The assessment is based on an investigation of building performance and management practices by use of a checklist and walk-through survey. The data is then used to generate a report, which provides a building rating and a list of recommendations to improve the building and management performance. The methodology originated in Canada and was developed by ECD Energy and Environment Canada and Terra Choice. It combined the BREEAM set of environmental issues with the Green Leaf Eco-Rating procedure.

CMHC commissioned the environmental assessment of six high-rise multi-residential buildings, using the BREEAM Green Leaf assessment methodology. The objectives of the pilot were:

- To find out how well the six buildings apply healthy housing principles.
- To obtain client feedback on environmental issues, including healthy housing principles.
- To obtain client feedback on the value of the environmental assessment.
- To find ways to better reflect healthy housing principles in the assessment methodology.

Six detailed, individual building assessment reports were undertaken. This report summarizes the results of the findings and the user survey.

Prepared by ECD Energy and Environment Canada Ltd. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2001. 55 pages

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

BRITISH COLUMBIA HIGH-RISE ENVELOPE DETAILS STUDY

In recent years, there have been significant efforts to understand and resolve moisture ingress and deterioration problems associated with wood-framed, low-rise building construction. Currently, this problem is acute in some wood-frame condominiums in the Lower Mainland of British Columbia. There are indications that the high-rise stock may also be experiencing similar moisture problems. The objective of this project is to examine the files of a sample of approximately forty buildings to assess whether the high-rise stock in the coastal climate of lower mainland BC is experiencing significant moisture related problems. The project will not estimate the extent of a potential problem. The project will focus specifically on envelope details and envelope systems that have failed, rather than building failures. Envelope types and components under review will include window/wall assemblies and light-gauge steel stud (back-up) wall assemblies with stucco, masonry and EIFS cladding systems. The work is scheduled for completion in the fall of 2001.

CMHC Project Officer : *Mark Salerno, Silvio Plescia* ***CIDN*** : 2234 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Research Highlight is available

BUILDING ENVELOPE REHABILITATION: CONSULTANT'S GUIDE and BUILDING ENVELOPE REHABILITATION: OWNER - PROPERTY MANAGER GUIDE

Many wood-frame buildings in B.C. have moisture problems -- and some have already been repaired once. Buildings that have never been rehabilitated and buildings that have been rehabilitated once will need work over the next few years. The fact that many buildings require a second rehabilitation emphasizes the need for the development of guidance with respect to effective rehabilitation measures.

The Owner-Property Manager Guide is intended to give owners and property managers a better understanding of the technical concepts and issues of rehabilitation. It is also intended to create a better understanding of the rehabilitation process. This improved understanding will help owners make more informed decisions, give property managers better guidance and create better communication among everyone involved in the rehabilitation of a building.

The Consultant's Guide has more technical detail than its companion volume listed above, and focuses more on the consultant's role in rehabilitation.

These Guides deal with the repair and rehabilitation of building envelopes of multi-unit wood-frame buildings in the coastal climate zone of British Columbia. Much of the material in these Guides, particularly process-related information, may apply to other climate zones and building types. However, some analysis of the impact of different climate factors and specific building attributes must be considered before using the Guides.

Prepared for Canada Mortgage and Housing Corporation by RDH Building Engineering Limited. CMHC Project Officers: Mark Salerno and Ken Ruest. Ottawa: CMHC, c2001.

Order Number for Owner-Property Manager Guide (103 pages): 62307 **Price: $89.95 + GST and Handling Charges

Order Number for Consultant's Guide (177 pages): 62305 **Price: $129.95 + GST and Handling Charges

NOTE: Aussi disponible en français sous le titre : Réhabilitation de l'enveloppe de bâtiments : Guide des propriétaires et du gestionnaire immobilier et Réhabilitation de l'enveloppe de bâtiments : Guide du consultant

STATUS : New Completed Reports
AVAILABILITY : CMHC Information Products

BUILDING FAILURES UPDATE 2000 - HIGH-RISE CONDOMINIUMS STUDIES

The purpose of this project is to provide CMHC with information (text, photos and drawings) to document building failures in high-rise condominium buildings in Ontario. The report will tabulate and compare findings from the CMHC/ONHWP 1990 document 'Construction Problems in Multi-family Residential Buildings'. No. 01-140 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

CMHC Project Officer : Luis de Miguel ***CIDN*** : 1782 0300022
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Research Highlight is available

CASE STUDY OF A SUCCESSFUL INNOVATIVE MULTI-UNIT RESIDENTIAL BUILDING: A COMPENDIUM OF RESEARCH OF THE CONSERVATION CO-OP BUILDING

In 1995, a multi-unit residential building, the Conservation Co-op, was constructed that embodied as many environmentally sound concepts and technologies as was possible within the confines of an extremely tight budget. The objective of the development team was to provide affordable housing with minimal environmental impact, enhanced durability and superior occupant health and comfort. After five full years of occupancy, Canada Mortgage and Housing Corporation initiated a review of the performance of the building, particularly with respect to energy and water consumption, indoor air quality and the operational experience with many of the "green" innovations included in the building. The review revealed that the enhanced insulation levels, high efficiency space and domestic hot water heating appliances, low E windows, and heat recovery ventilation were economically sound choices. It also illustrated the costs associated with continuous ventilation strategies and the need for more efficient fan-motor set technologies and distribution systems. Many of the "green" features met, or exceeded expectations while others failed altogether. Overall, the building is a successful project as it managed to incorporate many environmentally sound design and construction practices and its experiences are readily available to others considering similar projects.

This compendium contains the research projects conducted to assess the performance of the Conservation Co-op and the degree to which the original goals of the project were met. The research reports contained herein document annual operating energy and water use, embodied energy, and water reclamation efforts. The Compendium is prefaced with a summary paper that documents all of the innovative aspects of the building and provides an overview of the projects' successes and where improvements could be made. Further information is also available on the CMHC's web site www.cmhc-schl.gc.ca/research/highrise under the title Building Innovation.

Compiled by Duncan Hill, Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

CHARACTERIZATION OF THE STOCK OF CONDOMINIUM BUILDINGS IN CANADA

The number and characteristics of condominiums in Canada are unknown. This project will review Statistics Canada data files to estimate the number of condominiums in Canada, their location, age, number of storeys and number of suites. This information will be used to supplement the CMHC Rental Market Survey in order to estimate the overall population of multi-unit residential buildings in Canada. This information will also be used to determine the data requirements for a database of multi-unit buildings that describes the physical characteristics and energy consumption patterns of this class of buildings. Such a database is necessary to establish energy retrofit guidelines for multi-unit residential buildings.

The review by STATSCAN has found that the number of condominium buildings in Canada may be determined through building permit information available from STATSCAN files since 1970. STATSCAN is in the process of compiling this information to estimate the condominium building population.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 2277 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

CONDITION SURVEY OF CONDOMINIUMS IN THE GREATER TORONTO AREA (GTA)

This project's objective is to carry out a condition survey of condominiums in the Greater Toronto Area. This project will be carried out in two phases. Phase 1 focuses primarily on data collection and development of research methodologies for examining topics related to both physical and social issues. Phase 2 focuses on conducting the surveys and completing the analysis of the state of repair of the buildings.

CMHC Project Officer : *Sandra Marshall* ***CIDN*** : 2161 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

CONVERSION OF HIGH-RISE BUILDINGS TO RESIDENTIAL USE

The project will survey design and construction professionals and property managers of existing converted buildings across Canada to determine the extent and nature of technical problems which were encountered in the design and construction phases of the conversions; to determine the perception of property managers as to the concerns of the occupants; to determine the technical problems which have arisen as a result of these conversions; and to determine if there were any attempts to improve energy use performance or to introduce features to improve the sustainability of these buildings. Selected buildings would be documented as case studies in CMHC's Better Buildings/Innovative Buildings information series. The research report on this study is expected to be completed in 2001.

CMHC Project Officer : *Sandra Marshall* — ***CIDN*** : 2242 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

CONVERSION OF NON-RESIDENTIAL BUILDINGS TO MULTI-RESIDENTIAL USE

This cross Canada study is investigating the technical problems relating to the conversion of non-residential buildings to residential use. It will also address the issues which influence affordability in conversions to affordable housing indicating their potential to impede or encourage this housing. Case studies will be developed to show how these technical issues were overcome, with cost breakdowns.

CMHC Project Officer : *Sandra Marshall* — ***CIDN*** : 2242 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

DEVELOPMENT OF A CEMENT STRESS-SKIN EPS-CORE BUILDING SYSTEM

This project's objective is to verify the performance of a composite wall in order to determine if it is safe for use in ancillary and residential buildings.

CMHC Project Officer : *Silvio Plescia* — ***CIDN*** : 2437 0200011
Division : External Research Program — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

DEVELOPMENT OF THE HIGH-RISE STATISTICALLY REPRESENTATIVE HOUSING DATABASE (HISTAR)

A database structure to house building characteristics, energy and water usage data for multi-unit residential buildings has been completed. The database, known as HiSTAR (High rise building Statistically Representative Database) is in MS ACCESS format. The database will be used to compile and analyse building energy and water data collected during CMHC's research projects which take consultants into high-rise residential buildings. The HiSTAR database will be used to generate fact sheets on energy and water use and will be used for the analysis of the potential impact of energy and water efficiency upgrades.

CMHC Project Officer : *Duncan Hill* — ***CIDN*** : 2366 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

DEVELOPMENT OF THE HIGH-RISE STATISTICALLY REPRESENTATIVE HOUSING DATABASE (HISTAR) TASK 2: COLLECTION OF ADDITIONAL BUILDING FILES FOR THE HISTAR DATABASE

CMHC has commissioned a research project to gather information to characterize the energy and water consumption patterns in multi-unit residential buildings. This data will be used to supplement the data contained in the CMHC HiSTAR database. The HiSTAR database is used to baseline water and energy use in multi-unit residential buildings and is also used to evaluate the impact of building and occupancy characteristics and location on energy and water use.

CMHC Project Officer : *Duncan Hill* ***CIDN*** : 2366 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

ENVELOPE DRYING RATES EXPERIMENT: FINAL REPORT

The design and construction of building envelopes must be based on the assumption that some moisture will accumulate in the wall assembly, during construction and during the life of the building. Construction practices for multi-unit wood frame residential buildings in the coastal area of British Columbia, Canada are changing in response to a large number of envelope failures experienced in the period from 1985 to 1999. The new design approach includes the use of enhanced deflection and a drained cavity. While this approach will manage a large portion of the exterior moisture load, designs may also need to incorporate enhanced drying capabilities. A research program conducted at Forintek Canada Corp.'s western lab in Vancouver, Canada has evaluated the relative drying rates of wall assemblies under controlled laboratory conditions. The research ranks test wall panels in terms of their relative drying capacities, identifies potential wall locations at greater risk of slow drying (thus requiring enhanced material durability) and derives baseline data which can be used to improve parametric models of wall performance.

Results from the first group of 12 wall panels tested indicate that all the panels dried. There was a substantial range in drying rates, with ratios up to 3 times for comparable wall panels with and without a cavity. The major influences on drying rates were:

- The presence of a wide cavity (the 19 mm cavity performed better that either the 10 mm cavity or the 0 mm cavity);
- The choice of venting (top and bottom venting had a marginal improvement over venting at the bottom only);
- The choice of sheathing (plywood shearhed panels dried faster than OSB sheathed panels, partly because the plywood started out at a higher moisture content).

There was no clear indication that the choice of moisture barrier material had a substantial influence on drying.

The results of the test were compared to predictions made by CMHC's WALLDRY model. The WALLDRY parametric model demonstrated good predictive capabilities in terms of overall drying trends.

The first EDRA test has set a "benchmark" drying rate of 1600 ng/pa.sec.m2 for the effective permeance of the 'best drying' panel in the test group.

Prepared on behalf of Forintek Canada Corp. by Don Halzleden, House Works Building Science Inc. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officers: Silvio Plescia and Mark Salerno. Ottawa: CMHC, 2001. 1 CD-ROM

STATUS : New Completed CD-ROM
AVAILABILITY : Canadian Housing Information Centre

FIRE AND ACOUSTICAL PERFORMANCE OF FLOOR ASSEMBLIES - PHASE II

A continuation of an earlier project, this phase will be carried out over 4 years with a total budget of $2.2 million. A dozen industry and government partners have formed a consortium with the National Research Council of Canada to complete testing of several types of assemblies for residential construction. Results will be incorporated in the National Building Code of Canada. Both full and small scale fire and sound testing will be carried out. A large database will be developed which designers and builders can use for reference. Particular attention will be given to assemblies likely to just obtain an STC 50 rating.

CMHC Project Officer : *Luis de Miguel*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2375 0200001
STATUS : Ongoing

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS

Investigations of previously retrofitted solid masonry walls have been performed to determine the impact that the interior application of insulation has on the durability of the walls. The findings of the investigations will be published as case studies. Case studies will include a 120 year old solid masonry building in Montreal that was insulated 15 years ago by the application of spray applied polyurethane insulation on the interior of the walls, a 50 year old solid masonry office building in Ottawa that was insulated on the interior 8 years ago and several 1900's vintage apartment buildings in the Ottawa area. Preliminary indications are that the interior application of insulation has not adversely affected the durability of the masonry walls of the case study buildings but further investigation will be required to confirm that this conclusion generally holds true for other buildings.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : N/A
STATUS : Ongoing
*** NEW ***

IN-SITU MONITORING OF EXTERIOR WALL ASSEMBLIES - MONTREUX RESIDENCES

This project's objective is to monitor the performance of the exterior wall assemblies at the building complex, known as Montreux Residences, for temperature, relative humidity, moisture content and air pressure differentials.

CMHC Project Officer : *Silvio Plescia*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2254 0200001
STATUS : Ongoing

IN-SITU PERFORMANCE OF THE EXTERIOR WALL SYSTEM

The objective of this project is to monitor, assess and document the performance of a residential low-rise, wood-framed development which incorporates rainscreen design technology, to analyze data to determine the effectiveness of wood frame rainscreen wall assemblies and to identify the relative performance of building envelope features that provide improved performance or minimizes the risk of envelope problems.

CMHC Project Officer : *Silvio Plescia*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2254 0200002
STATUS : Ongoing

LOAD PROFILES IN MULTI-UNIT RESIDENTIAL BUILDINGS: PILOT STUDY ON LOAD PROFILING IN METRO TORONTO HOUSING

This project will describe load profiling work underway in Metro Toronto Housing Corporation multi-unit residential buildings. The project will characterize thermal, electrical power and water requirements in the apartment buildings and will also identify technical issues encountered in load monitoring and data interpretation. This project is being used as a pilot project to identify the factors that will have to be considered in a larger project being planned by CMHC and Natural Resources Canada to assess the energy and water load profiles in low and high-rise housing.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2201 0200001
STATUS : Ongoing

MODELING OF AIR/MOISTURE MOVEMENT AND DURABILITY PERFORMANCE OF RESIDENTIAL AND COMMERCIAL BUILDINGS

The purpose of this project is to develop knowledge to assess the impact of various wall design and indoor-outdoor environmental conditions on the durability and energy efficiency of new and retrofitted high-rise residential and commercial building systems. The hygIRC heat, air and moisture model developed by the Institute for Research in Construction is being used to model common wall systems. Retrofits to improve the airtightness and insulation levels in the walls were developed and are being applied to the basic wall systems. The hygIRC model will simulate heat, air and moisture conditions within the retrofitted walls to determine how the retrofits affect the durability of the wall system. This information will be used as a means to confirm the integrity of several specific retrofit measures developed for high-rise wall structures before they are recommended to the building industry.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1934 0200003
STATUS : Ongoing

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS

The innovative mechanical and electrical energy producing systems in a multi-unit residential buildings project in Toronto were monitored and assessed to determine their economic viability. The project involved the assessment of the buildings cogeneration, space heating, absorption chilling, domestic hot water and ventilation systems and a review of natural gas and electricity use. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided electrical use and other considerations was determined. An inspection of the individual space conditioning systems within the suites was also performed. The findings of the investigation showed that the operation costs (fuel use, maintenance and repair) of the cogeneration system was not economically viable. Key findings include the observation that the system was not making full use of the heat generated by the cogeneration systems. The report estimated that even if all of the heat was recovered from the cogeneration system, the benefit of the system to the building's owners would be marginal. Given that the building embodies some of the most advanced technologies that allow for energy efficiency, cascading and recovery, operation costs should have been low relative to conventional buildings.

CMHC coordinated a meeting of the project developer, engineering design team, cogeneration system manufacturer, utility representative and industry experts and stakeholders to review the situation in the building and to determine whether or not the performance of the building systems could be improved. The outcome of the meeting was that a review of the utility meters and billing history should be undertaken to confirm that the basic information being used to assess the performance of the building is correct. CMHC is working with Ontario Hydro Energy and Admic Controls to develop a metering review plan and evaluation.

CMHC Project Officer : *Duncan Hill*
CIDN : 1260 0800001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

MONITORING THE PERFORMANCE OF AN EIFS RETROFIT ON A 15 STOREY APARTMENT BUILDING

Morrison Hershfield Limited was retained by Canada Mortgage and Housing Corporation to monitor the performance of the rehabilitation of a 15-storey, 112-unit apartment complex located in Toronto. A major phase of the rehabilitation involved installation of exterior insulation and finish system (EIFS) rainscreen cladding over the existing brick masonry walls. The monitoring program included analysis of temperature, moisture content and air pressure measured at five locations over a winter season.

The original wall construction was clay brick masonry with concrete block backup, expanded polystyrene insulation, and plaster interior finish. The EIFS cladding consisted of acrylic stucco lamina installed over expanded polystyrene insulation that was adhered to the brick masonry using a trowel-on, proprietary material. The trowel-on material was intended to function as the air barrier and drainage plane. Vertical channels, which were located on the interior face of the insulation, were intended to drain rainwater that penetrated to the coating through drain blocks located every 5 stories.

The project objectives were:

1. To document the development of a building envelope retrofit strategy for a residential high rise building.
2. To monitor, assess and document the performance of a residential high rise building envelope retrofit.
3. To assess the degree to which the monitoring protocol can be implemented as part of regular operation and maintenance activities for new and existing buildings.
4. To assess the potential for the development of a commercially viable, building envelope performance monitoring protocol.

The objective of the monitoring program was to establish the performance of the retrofit wall with respect to heat, air and moisture control.

Prepared by Morrison Hershfield Limited. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2000. (70 pages)

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

OPERATION AND MAINTENANCE GUIDES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings. CMHC will be updating the guides, revising the language and will be adding healthy housing components to the guides prior to publication.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1774 0300004
STATUS : Ongoing

PERFORMANCE MONITORING OF A BRICK VENEER/STEEL STUD WALL SYSTEM: PHASE 4 RESULTS: REVISION 1

The Brick veneer/steel stud (BV/SS) wall system has become very popular over the last 20 years, however, the rapid adoption of this wall system has preceded the development of adequate design and construction standards. This situation has led to concerns regarding the long term safety, serviceability and durability of BV/SS wall systems. Therefore, Canada Mortgage and Housing Corporation (CMHC) has been evaluating BV/SS wall systems over the past several years by commissioning studies by various consultants, including Keller Engineering Associates Inc. (KEA).

Phase 4 of this study by KEA involved a fourth year (in 1996 and 1997) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements as well as temperature gradients. In an attempt to improve venting of the wall cavity, vent holes were cut into every second vertical mortar joint in the top course of the monitored brick veneer section. The performance of a test wall was monitored using various temperature, moisture and air pressure sensors that were connected to an automatic data logging system. Even though the BV/SS wall system is typical of current practices and workmanship was mostly satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are mainly due to design weaknesses, illustrating the need for improved design and construction standards.

Prepared by Keller Engineering Associates Inc. CMHC Project Officer: Jacques Rousseau. Ottawa: Canada Mortgage and Housing Corporation, December 1999. (69 pages)

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

QUALITY ASSURANCE PROTOCOL TEST DRIVE

"Quality by Design" was commissioned as the Quality Assurance Protocol by Canada Mortgage and Housing Corporation in order to establish a management system for the assurance of quality of the exterior of multi-storey wood frame buildings located in the coastal climate of British Columbia. This is part of the initiatives undertaken by the Building Envelope Research Consortium, of which CMHC is a member, to address the "leaky condo" issue as it pertains to new construction. A Quality Assurance Protocol is a set of recommendations and guidelines which, if followed, will assure an improved level of quality in design, construction and maintenance.

The original "Quality by Design" was published in January 1999. This current edition has been refined extensively based upon ongoing input from a wide variety of sources, and in particular, the document has been refined based upon applying it to a real project.

Prepared by Pro Pacific Architecture Limited. Principal investigators for the project were Brian Palmquist and William A. Gies, assisted by quality systems consultant Arc Rajtar. The "test drive" revisions were prepared by Brain Palmquist. CMHC Project Officers: Jacques Rousseau and Mark Salerno. Ottawa: Canada Mortgage and Housing Corporation, c2000.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

RAIN PENETRATION CONTROL: APPLYING CURRENT KNOWLEDGE

Water is the most significant factor in the premature deterioration of buildings. It can damage some materials directly and reduce the effectiveness of insulation. It is the major factor in the corrosion of metals, the chemical breakdown of many organic materials and the growth of mold and rot. Controlling water penetration, as well as its location, duration and phase (vapour, liquid or solid), is often the most critical factor in achieving long-term performance of a building envelope assembly.

This document focuses primarily on rain penetration control in walls and windows. Other wetting mechanisms include condensation and exposure to ground water. Moisture can be removed from a building assembly through drainage, by diffusion or venting (convective air change) to a drier indoor or outdoor environment. Most building assemblies and materials have some tolerance for infrequent and short duration wetting. Some infrequent passage of water to the inside is a minor inconvenience rather than a disaster. Determining how much effort and expense can be justified to minimize water penetration or evaluating what assembly types are appropriate for a particular building application and location is an exercise in judgment and risk management.

Following a discussion of several approaches to water penetration control in walls, including architectural design, there is a detailed explanation of the rain-screen principle and its application to contemporary buildings. Designers are further challenged to incorporate the Pressure Equalized Rain-screen (PER) principles. The PER system uses compartment seals to divide the cavity into a series of chambers in addition to the elements of a simple rainscreen. This limits lateral air flow in the cavity and increases pressure equalization, ultimately reducing the amount of water entering the interior wall. Remarkably, in pressure equalized rainscreen walls or joints, leakage is reduced by making bigger holes in the outside surface. This is counterintuitive.

To help design rainscreen curtain walls CMHC developed the "RainScreen" software. It allows designers to vary the parameters of their rain screen system and graphically see the resulting dynamic pressure distribution on cladding and air barrier (backpan) layers. Its mathematical engine is based on the CMHC report "Rainscreen" by Jacques Rousseau. "RainScreen 2.1" adds many new features and an easy GUI interface, using either Windows (3.1 or 95) or Macintosh systems.

The "RainScreen v2.1" software may be downloaded free from CMHC at:
ftp://ftp.cmhc-schl.gc.ca/highrise/rainscreen .html.

Ottawa: Canada Mortgage and Housing Corporation, 2001, c1999.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies, available on our web site under the title: "Better Buildings", document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies are included to reflect regional repair and retrofit priorities. The studies are useful for other members of the multi-unit residential building industry to refer to when considering similar projects.

STATUS : Completed

AVAILABILITY : Available on CMHC's Web site: http://www.cmhc-schl.gc.ca/en/burema/himu/ bebufa/bebufa_021.cfm

REPAIR AND RETROFIT CASE STUDIES OF THE LOFTS CORTICELLI COMPLEX

A field project to review the condition of the solid masonry walls of a historic building in Montréal has been completed. The building, originally constructed in the 1800's, was converted to residential use in 1986. As a part of the renovation, the interior of the solid masonry brick walls was insulated with spray applied polyurethane foam and fibreglass batt insulation. As this type of insulation retrofit was thought to be responsible for the deterioration of solid masonry walls, CMHC initiated a project to assess the condition of the building envelope and all of the elements. The field survey found that the walls, after 14-15 years of service, were in good condition. No conditions or symptoms were found that would lead to the conclusion that the application of the spray applied polyurethane foam and other finishing materials had, in anyway, undermined the integrity of the wall system. This finding is important as many older buildings in the urban areas of Canada are being renovated to residential use and exterior insulation retrofits are not possible for heritage or aesthetic reasons. While the finding of this study is specific to this one building, it appears that interior insulation wall retrofits may be possible as long as steps are taken to prevent the intrusion of moisture and air leakage from both interior and exterior sources into the wall assembly. Susceptible wall members, such as embedded wood structural members should be protected as well. CMHC will perform additional case studies of retrofitted solid masonry walls to provide a better understanding of the strengths and weaknesses of this form of renovation.

CMHC Project Officer : *Duncan Hill*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1782 0300020
STATUS : Ongoing

TECHNOLOGY ROAD MAP FOR INTELLIGENT BUILDING TECHNOLOGIES

The objective of this project is to develop a road map for intelligent building technologies, considering the potential technological, societal and other developments that will affect the industry within the next five years.

CMHC Project Officer : *Sandra Marshall*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2388 0200001
STATUS : Ongoing

HOME OWNERSHIP

TECHNICAL ASPECTS OF SELLING NEW HOMES

The purpose of this initiative was to support a project being managed by the Professional Home Builders Institute of Alberta (PHBIA) which was to develop a 12 to 18 hour interactive CD-ROM course on "The Technical Aspects of Selling New Homes". The CD-ROM course is based on two existing courses and includes video clips, audio, graphics, text, self-tests and optional exams. The information contained in the CD-ROM is beneficial to home builders' new home sales staff, and to real estate sales agents who are involved in selling new homes. Also, new home buyers can take the course to raise their awareness of the home buying process. The CD-ROM can be used as an ongoing reference.

STATUS : New Completed CD-ROM

AVAILABILITY : For more information, or to order a copy of this CD-ROM, please contact the Professional Home Builders Institute of Alberta at (403) 216-8310 or by e-mail at phbia@phbia.com

HOUSE CONSTRUCTION

ALTERNATIVE WALL SYSTEMS FOR LOW-RISE RESIDENTIAL CONSTRUCTION

The purpose of this study is to research ten alternative wall systems for low-rise housing in use today. These systems will include insulated concrete forms, straw bale, structural insulated panels, stack wall, concrete block, post and beam, log, earth construction, manufactured wood, and lightweight steel. The results of this study will be beneficial to those in the industry to help them make better informed decisions on choices between alternative systems. This study will take an inventory of and investigate the differences, benefits and limitations of the various building systems which are currently in use as compared to the typical wood-frame, stick-built construction of low-rise housing. It will consider the benefits and drawbacks of the various systems. The study will examine a number of the factors to be considered by a builder or homeowner to help them understand the differences between the available system choices so they may evaluate and select systems appropriate to their clients, house designs, trade practices and skills, and regions. The study will include reviews by representatives for each of the wall systems. The anticipated completion date is late 2001.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : 2119 0200

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

BUILDING ENVELOPE SOLUTIONS - THEORY AND PRACTICE

This is a partnership project between the Canadian Home Builder's Association of British Columbia (CHBA/BC), the Homeowner Protection Office (HPO) of B.C. and CMHC. The purpose of the project, previously called "Builders ToolBox", is to develop a course curriculum and course training materials to train general contractors and subtrades in building construction practices that would enable them to construct highly durable building envelopes for new residential wood-frame buildings located in the lower mainland of British Columbia and Vancouver Island and to restore and upgrade the envelopes of existing buildings. The end product will be a Trainer's Manual complete with all the necessary training aids, and a Participant's Manual. The course will be tailored to meet the needs of the residential construction industry and would use a full range of teaching methods to ensure that all participants absorb the information provided. The course development is expected to be completed and pilot testing started by Fall 2001. The course pilot will consist of three seminars over a six month period with up to 25 participants per seminar. CHBA-BC will be granted the exclusive right to deliver this course in the province of BC for a two year period.

CMHC Project Officer : *Darrel Smith, Mark Salerno* ***CIDN*** : 2287 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

CD-ROM VERSION OF THE CANADIAN WOOD-FRAME HOUSE CONSTRUCTION

The purpose of this project was to design and develop a CD-ROM version of CMHC's Canadian Wood-Frame House Construction (CWFHC) publication complete with a number of multimedia enhancements and other special features such as video clips, animations and 4D illustrations. The CD ROM includes a number of "calculators" to help the user determine the specified snow loads for specific locations across Canada, and to select proper beam and joist sizes and spacings. It also includes the Glossary of Housing Terms with links to and from the text and illustrations in the Canadian Wood-Frame House Construction, to serve as an illustrated glossary. Other features of this product are:

- It is a web-based interactive CD-ROM;
- A full-text search engine allows the user to search for any term;
- Planning ahead and checking back notes appear throughout the text with links to illustrations and video footage;
- It is based on the National Building Codes; and
- It contains 144 high quality illustrations that can be optimized for printing.

The CD-ROM system requirements are as follows:

For PC:

i486â , Pentiumâ
Microsoftâ Windowsâ 95/
Windows NT â 4.0
32 MB RAM
12 MB hard-disk space
Netscape 4x or Internet
Explorer 4x
Adobe Acrobat Reader Version
4.0
Appleâ QuickTime 4.0
Microsoftâ Excel 97®

For Mac:

Macintosh PowerMac G3
Macintosh System OS 7.5
64 MB RAM
Netscape 4x or Internet
Explorer 4x
Adobe Acrobat Reader
Version 4.0
Appleâ QuickTime 4.0
Microsoftâ Excel 98

The CD ROM is now available separately or packaged with a hard copy of the CWFHC.

Order number for CD-ROM only: 62237; Price: $64.95 + GST and handling charges
Order number for CD-ROM and Guide: 62234 Price: $84.95 + GST and handling charges

By purchasing the CD-ROM + Guide package:

You will save $5.00 off the price of purchasing them separately; and
Have the guide as a handy on-site reference

For clients who wish to demo the product, they may call to receive a copy of the Canadian Wood-Frame House Construction demo CD-ROM.

STATUS : Completed CD-ROM is available
AVAILABILITY : CMHC Information Products

COMPARING THE PERFORMANCE OF TWO-COAT VS THREE-COAT STUCCO

CMHC through its Prairie and Northwest Territories Business Service Centre in Calgary is supporting this Alberta Housing Industry Technical Committee (AHITC) research project. The research will use laboratory and field testing to compare the performance of two coat stucco commonly used in the Prairies and standard three coat stucco. If they perform similarly, building code changes may be recommended. The effects of stucco additives and mixtures will also be examined. Currently the contractor has completed the review of test procedures and has drafted the laboratory work report. The field work that follows will involve testing samples of two-coat stucco removed from existing houses to verify their performance.

CMHC Project Officer : *Don Fugler, Colin Crumb* ***CIDN*** : 2399 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

DEVELOPMENT OF AN INSTRUCTOR'S GUIDE AND AN ACCOMPANYING PRESENTATION FOR RESIDENTIAL GUIDE TO EARTHQUAKE RESISTANCE

The objective of this project is to develop a course to advocate the importance of, and to convey knowledge on making houses more resistant to earthquakes. There will be two courses developed. The first one, which will be developed in partnership with the British Columbia Institute of Technology (BCIT), will be approximately 18-24 hours in length and will be targeted to designers, builders and renovators. It will cover information on construction techniques to better prepare housing to withstand an earthquake. The second course, which will be developed in-house by CMHC staff from the long course, will be approximately 6 hours and targeted to a general audience of consumers. It will address consumers' concerns regarding the durability of their housing during disasters. The development of the industry course is currently underway and is expected to be delivered through BCIT this Fall.

CMHC Project Officer : *Darrel Smith, Mark Salerno* ***CIDN*** :
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Seminar/training is not yet available *** NEW ***

FEASIBILITY OF DEVELOPING A BUILDING CANADA PROGRAM

The purpose of this project is to examine the feasibility of developing a Building Canada program similar to the Building America model. To be effective, the Canadian program needs to be of interest to Canadian builders and recognize the different environment by responding to their real needs, i.e., reducing construction costs, customer callbacks, warranty claims, construction time, and construction waste, while at the same time improving the energy efficiency of their new houses. The program will result in little or no additional cost for the builder and wherever possible a reduction in costs. This study is a necessary first step to determine if a Building Canada program is viable and could be established in Canada. It will draw from the experience of the Building America program as well as the results achieved in a pilot of this program with two large Canadian builders. This project will be managed by EnerQuality Corporation on behalf of a consortium of partners including: CMHC, Enbridge Consumers Gas, Union Gas, Owens Corning, Natural Resources Canada, and the National Research Council (through its Industrial Research Assistance Program). Once this initial program design phase has been completed, and if found feasible, the program will be launched and expanded as part of subsequent phases.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : 2387 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

FEASIBILITY STUDY ON THE DEVELOPMENT OF A COMMISSIONING GUIDE FOR NEW HOUSES

The purpose of this project was to assess the importance and determine the feasibility of developing a commissioning guide for builders and buyers of new houses. The research indicated that generally home builders do not currently carry out a whole house commissioning and do not have a protocol to do so. However with houses becoming more complex, there is greater need to have a competent person investigate the whole house and all its systems to ensure they are installed and functioning as originally designed before delivery to the buyer. To be effective and useful, the commissioning guide must be simple to use and yet comprehensive. It must not add significantly to the cost of the house. Commissioning should not be a duplication of services already in place. The guide should include a review of the installation and operation of all major components and systems of the house. The study found that the benefits of the house commissioning process are that:

- houses perform better
- homeowners are assured the house is built as expected according to the plans and specifications and the components and systems have been installed and are functioning properly
- homeowners are better informed about the systems in their houses and how they work (resulting in less call backs for contractors), and
- potential problems are identified before damage occurs (also resulting in less call backs for contractors and reduced costs for warranty programs)

The study identified a need and found interest by clients and stakeholders in the development of a commissioning guide. As a result, CMHC is considering the development of a commissioning guide.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : 2360 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

FEASIBILITY STUDY: DEVELOPING A GUIDE FOR ENGINEERED WOOD I-JOIST FLOOR SYSTEMS

The purpose of this project was to confirm the need for and determine the feasibility of producing a generic guide for builders on the selection and proper installation of engineered wood I-joist floor systems. Overall, there was strong support from the various stakeholders for the development of a generic I-joist guide. The strongest support came from building officials across the country. Building officials see the guide as something that could inform not only the framing crews but also the sub-trades who occasionally damage the products. I-joist manufacturers support the development of a guide, however, they do not think it should include performance aspects such as spans and floor load tables. According to builders, the guide should contain as many details as possible, but at minimum details on nailing patterns for double joists, rim joists, stair openings, flue box, and cantilevers. Based on stakeholder input, the guide should cover:

- general I-joist information;
- special design and installation considerations;
- generic details;
- proper use of framing hardware and blocking; and
- storage and handling recommendations.

CMHC is considering the development of this guide. Potential interested partners will be approached.

Prepared by Buchan, Lawton, Parent Ltd. CMHC Project Officer: Darrel R. Smith. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. 76 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

HOUSE CONSTRUCTION

RESEARCH ON SOLUTIONS TO PYRITE-RELATED BACKFILL EXPANSION PROBLEMS

This study will draw up an inventory of the problems associated with the reactions of the pyrite (iron sulphide) contained in the backfill stone used under slabs in residential properties. Two hundred houses inventoried in three Montréal South-Shore municipalities will be visited under the CTQ-M200 protocol developed as part of the work of the Quebec technical committee on pyrite-related problems. The results of the study will identify possible causes and potential affordable solutions. The objective is to provide the industry with a more global vision of this new situation.

CMHC Project Officer : *Jacqueline Meunier-Bureau* ***STATUS*** : Ongoing
Division : Research Division **AVAILABILITY :** Product is not yet available

WOOD USE STUDY IN STRAW BALE BUILDING

This is another in a series of small projects assessing the acceptability of straw bale walls for housing. The contractor will sum up all the wood used during the construction of his straw bale building, and then compare the wood use to a simulated, conventional building of the same size and design. Straw bale buildings are always touted as being environmentally sound for their reduction of wood used; this project will attempt to establish and quantify that reduction.

CMHC Project Officer : *Don Fugler* ***CIDN*** : 2441 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

HOUSE CONSTRUCTION INDUSTRY

TECHNOLOGY DISSEMINATION: TRIGGERING INNOVATION ADOPTION IN CANADA'S HOME CONSTRUCTION INDUSTRY

Cost saving technologies are often slow to be adopted in Canadian house construction. This may be due in part to most contractors having limited abilities to undertake research and evaluation, and develop the competency to use such advances. The goal of this External Research Program work was to devise an information dissemination technique which focuses on the process of innovation introduction rather than the innovations themselves. It is felt that by "reasonably demonstrating" the value of various innovations to subcontractors, there will subsequently be a "natural" spread to other projects as the subcontractors utilize their newly acquired cost-effective techniques to gain a competitive advantage. The work includes a discussion of a literature review and the identification and selection of innovation technologies. This project report will be of interest to researchers, builders and developers who wish to integrate new and improved building process onto the mainstream of the construction industry.

Prepared by B. Ian Bazley. CMHC Project Officer: Thomas Green. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. (External Research Program Report) 113 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre
** **SEE ALSO**: p. 91- 92

HOUSING DESIGN

DESIGN MULTIPLE-UNIT CHUM'S AND MODULAR HOUSE PACKAGES FOR URBAN AND SUBURBAN, REMOTE AND NORTHERN COMMUNITIES

The purpose of this project is to support the preparation of design drawings, construction specifications and cost estimates for several Multi-Unit CHUM's (Containerized Heat and Utilities Modules), and for matching Modular House Designs that would integrate with these CHUM's, specifically for the suburban and rural, remote and northern communities contemplated. The project is about 60% complete - a draft version of a design manual has been produced in both a printed format and as a CD-ROM. The project has been delayed in part due to difficulties in establishing candidate sites for demonstration and/or commercial application. The manufactured housing industry has been a key participant/supporter of this project.

CMHC Project Officer : *Chris Ives* — ***CIDN*** : 2407 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

MONTRÉAL: A GREAT TRADITION OF MEDIUM-DENSITY HOUSING

This project aims to highlight the adaptation processes of housing and building types throughout the various phases of the evolution of "plex" formulas (duplex, triplex, fourplex, fiveplex ...) in Montreal over two construction cycles between 1866 and 1900.

CMHC Project Officer : *Brian Eames* — ***CIDN*** : 1455 0200001
Division : External Research Program — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

INDOOR ENVIRONMENT

DEFINING THE CONVECTIVE DRIVING FORCE FOR SOIL GAS INTRUSION INTO HOUSES: FINAL REPORT

The objective of this project was to evaluate soil gas pressures surrounding building envelopes, taking into account the role of geological variability, surface covers, and other environmental factors. The data gathered will be used to predict soil gas flux into houses and its effects on indoor air quality.

The project was carried out in two phases. In the first phase, soil gas pressures around and across the basement envelope were monitored at five different sites for a minimum period of six weeks. Houses at two of the five sites did show high soil gas pressures developing under certain climatic conditions. Following this work, a new mathematical model was developed to augment the current models in the literature. The new model was aimed at defining the rate of soil gas influx in situations where variations in the stratigraphy could cause increased convective transport. The computer model developed for this project was able to simulate soil gas entry.

Prepared by adomait Environmental Solutions. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2001. (External Research Program Research Report) 137 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

DEPRESSURIZATION TESTING OF SPILLAGE-RESISTANT APPLIANCES

This project involves field testing of the installed performance of 100 appliances that are theoretically 'spillage-resistant', to see if they function satisfactorily under high levels of house depressurization. The work is underway with a contractor in the Peterborough area. If a significant number of the 100 appliances fail at low depressurizations, then the project will proceed to a laboratory testing phase. If the appliances generally function well at 50 Pascals of house depressurization, no further testing will be undertaken.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2492 0200001
STATUS : Ongoing
*** NEW ***

DEVELOPMENT OF A PROCEDURE FOR ESTIMATING AIR CHANGE RATES USING A SPECIFIC ODOUR AS A TRACER GAS

When householders complain about poor indoor air quality or high energy costs, the rate of outdoor air infiltration is critical in analyzing their problem. If the rate is very high, this could lead to high heating costs. If the rate is low, poor air quality may result and adding a ventilation system would be useful. However, there is no simple quantitative way for residents to estimate ventilation rates in their own house. This research project aimed at developing a procedure for estimating of air change rates, using a specific odour as a tracer gas. The research has not been particularly successful. The contractor selected a convenient and available odour source, wooden matches, but their usage as a whole house test procedure turned out to be impractical. They may be more suitable for room air change testing. Further testing is required (but not planned) in order to evaluate the use of odours to determine air change rates in small spaces.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2396 0200002
STATUS : Ongoing

HEALTHY INDOOR ENVIRONMENTS PHASE 2: CONSULTATION PROCESS

This is the second phase of the project "Towards the Use of Voluntary Initiatives for Achieving Healthy Indoor Environments in Canada" which was a 1998-99 partnership project led by Pollution Probe Foundation in which CMHC participated. Recommendations from the initial report include the development of a comprehensive multi-stakeholder strategy to address the Canadian indoor environment issue. This Phase 2 work, led by Pollution Probe in partnership with a number of government and industry stakeholders, involved the hosting of three regional consultations (Toronto, November 2000; Halifax, January 2001; and Vancouver, March 2001) and a web based database discussion forum. The objective of phase 2 is to develop a vision of what is possible in the field of healthy indoor environments, a strategy to achieve it, and multi-stakeholder commitment to realize that strategy. The project has been completed and the final report will be available in Spring 2002.

CMHC Project Officer : *Thomas Green*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2383 0200001
STATUS : Ongoing

INDOOR AIR POLLUTION FROM ATTACHED GARAGES

CMHC contributed to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months. Further field testing took place in the winter of 1998/99, including modeling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. Modeling has given different results, and there is additional work to model the results a second time in the fall of 2001. Reports on various aspects of the project are being prepared by the agencies involved. CMHC released a Research Highlight (Technical Series, 01-122) on the airtightness testing aspect of the project in summer 2001.

CMHC Project Officer : *Don Fugler*
Division : Research Division
AVAILABILITY : Research Highlight is available

CIDN : 1910 0200002
STATUS : Ongoing

PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES

This joint study between CMHC, Carleton University, Health Canada and others is examining a large sample of homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. A total of 231 houses have been tested at the end of the fourth year of the project. An additional 60 houses are to be tested during winter 2001-02. Due to the long term nature of this research, research reports have not as yet been issued.

CMHC Project Officer : *Ken Ruest*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1618 0300001-2
STATUS : Ongoing

RENOVATING THE HOME FOR ASTHMA: AN INTERVENTION STUDY

The purpose of this project is to study the relationship between air quality in housing and respiratory health in renovated housing. Health Canada, Carleton University and Natural Resources Canada are partners and are represented in the project advisory committee. Funding is from CMHC, with contribution from the Program for Energy Research and Development (PERD). The methodology is similar to that of a completed pilot project which studied the effect of renovating the homes for indoor air quality on the asthmatic condition of the occupants. This project will look at 20 case studies of moldy houses selected from different parts of the country and renovated by their owners. Remediation of the houses will incorporate measures to improve their energy efficiency. The output will be a research report that will be of interest to builders and renovators, the general public, the asthmatic population, researchers and physicians. The study should be complete by late 2002.

CMHC Project Officer : *Virginia Salares*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2157 0200001
STATUS : Ongoing

RESEARCH CHAIR IN HEALTH AND INDOOR AIR QUALITY - CARLETON UNIVERSITY

CMHC is participating in an Industrial Research Chair in Health and Indoor Air Quality at Carleton University. The principal funding for this Chair is being provided by the Natural Sciences and Engineering Research Council (NSERC), Paracel Laboratories, Morrison Hershfield Ltd., Health Canada, Kingston General Hospital, Carleton University and CMHC. The Chair, in collaboration with its partners, will develop more rapid and cost effective methods for measuring the types and amount of mold in buildings and exposures of the occupants, construct a database of cultures of molds found in moisture troubled buildings, prepare purified extracts of the molds for allergy diagnostic tests and undertake studies of the effects of these molds on lung cells. The output from this Chair would have far-reaching benefits for the general population in the clinical diagnosis of mold allergy and the mitigation of mold contaminated buildings. A five year research program of the Chair is underway.

CMHC Project Officer : *Virginia Salares*
CIDN : 2269 0600
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

STUDY OF DISPLACEMENT VENTILATION SYSTEMS FOR RESIDENTIAL HOUSES WITH RADIANT FLOOR HEATING SYSTEMS

It is estimated that about 1% of Canadians are environmentally hypersensitive. These people suffer partial to total debilitation. Some of them require a home environment that is as free as possible from air-borne contaminants. Designing and constructing such houses are hampered by the lack of practical guidelines both for selecting suitable building materials and furnishings, and for designing and installing effective ventilation systems. The Canada Mortgage and Housing Corporation has recently designed and constructed a prototype house for environmentally hypersensitive individuals. It includes a range of features to help to achieve an acceptable indoor environment for these people at a minimal cost. These features include the use of commercially available low emission building materials and easily cleanable interior finishing, and a specially designed displacement ventilation system.

A joint project was established between the Canada Mortgage and Housing Corporation and the Institute for Research in Construction to assess the performance of the displacement ventilation system installed in this prototype house. This report presents the results of this evaluation.

The results will help to develop guidelines for designing and constructing suitable and affordable housing for environmentally hypersensitive individuals. Some of the measures used in this prototype house may also be adopted in new and existing houses to improve indoor air quality.

Prepared by J.S. Zhang, R.J. Magee and C.Y. Shaw of the National Research Council of Canada. Ottawa: Canada Mortgage and Housing Corporation, 2001. 26 pages

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

LAND USE ISSUES IMPEDING AFFORDABLE HOUSING WITH MOBILE HOMES

This project report is a land use study focusing on the legislative barriers to manufactured housing. This project was divided into three phases and a final report. Phase 1 reviews and compares Canadian and American manufactured housing legislation, regulatory barriers and government and industry approaches to these barriers. Phase 2, analyzes the Canadian manufactured housing industry, identifies the major issues, suggests how the American model may apply, and recommends how the existing legislative barriers can be addressed. Phase 3, focuses on municipal regulations and includes a survey of Ontario municipalities and a survey of municipal solicitors regarding zoning discrimination. The final report contains all three phases and an action plan, which sets out direction and strategy for addressing legislative barriers that negatively affect manufactured housing development in Canada at all levels of government.

Prepared by Ron Corbett. CMHC Project Officer: Doug Pollard. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. 146 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

MANUFACTURED HOUSING CONSULTANTS' TRAINING PROGRAM - PHASE II

This is a partnership project between the Canadian Manufactured Housing Institute (CMHI), the Provincial Manufactured Housing Associations of B.C., Alberta and Saskatchewan, Ontario and Atlantic Canada, and CMHC. The purpose of this project is to build on and improve the two day Manufactured Housing Consultants' Training Program and to ready it for ongoing delivery at the provincial level. The participant's manual and the trainer's material will be revised to incorporate improvements resulting from the pilot program, and new additional material will be developed such as: section for modular retailers, participants workbook, and marketing and promotional materials. These changes are necessary to ensure a high level of quality, effectiveness and consistency of the course delivery by the various provincial industry associations. This work is anticipated to be completed by late 2001. Once this work is completed, the program will be delivered through a partnership arrangement with provincial associations/organizations and it will be open to all representatives of the manufactured housing industry in Canada.

CMHC Project Officer : *Darrel Smith*
CIDN : 2410 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

MANUFACTURED HOUSING: UPDATING AND REWRITING LOCAL REGULATIONS: REGIONAL DISTRICT OF NORTH OKANAGAN = L'HABITATION USINÉE : MISE À JOUR ET RÉÉCRITURE DES RÈGLEMENTS LOCAUX : DISTRICT RÉGIONAL DE NORTH OKANAGAN

The purpose of this project, sponsored by B.C.'s Regional District of North Okanagan (RDNO), was to end discrimination against manufactured housing and encourage its parity with site-built homes. In the RDNO, officials recognized the need for more affordable housing within the jurisdiction and wanted to promote and encourage alternative housing forms. They realized their out of date regulations governing manufactured housing were part of the problem. This project examined the regulatory environment for manufactured housing in the Regional District of North Okanagan, in south central British Columbia. As a result, the RDNO and one of its incorporated townships adopted regulations making it easier for this type of housing to flourish. It proposed solutions, that if adopted Canada-wide would put manufactured housing on an equal regulatory footing with site-built homes. The adopted RDNO Manufactured Home Community Bylaw is included as an appendix in this ACT case study.

MANUFACTURED HOUSING

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study)

Order Number: 61425

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

** **SEE ALSO:** Design Multiple Unit CHUM's and Modular House Packages for Urban and Suburban, Remote and Northern Communities, p. 51.

MOISTURE AND MOLD

BETTER BUILDINGS CASE STUDY - CONDENSATION CONTROL IN THE EXTERIOR WALLS OF THE CCOC APARTMENT BUILDING AT 520 BRONSON STREET; A DBZ REMEDIAL REPAIR PROJECT

This project's objective is to provide CMHC with information (text, photos and drawings) to document, as a case study, the installation and performance of a DBZ system in the building mentioned above.

CMHC Project Officer : Luis de Miguel — ***CIDN*** : 1782 0300036
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — * **NEW** *

CLEANING UP YOUR HOUSE AFTER A FLOOD AND CLEAN-UP PROCEDURES FOR MOLD IN HOUSES

Two CMHC publications, "Cleaning Up Your House After a Flood" and "Clean-up Procedures for Mold in Houses", are undergoing revision. These documents have been widely used since 1993. The revision will incorporate the most up-to-date information on dealing with mold and provide steps for homeowners to follow in assessing and fixing the problem.

CMHC Project Officer : Virginia Salares — ***CIDN*** : 2447 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — * **NEW** *

CONDOMINIUM OWNERS' GUIDE TO MOLD. ABOUT YOUR HOUSE; CE36

This eight page fact sheet is designed to teach condominium owners and occupants how to recognize mold and how to take action against mold. It describes what molds are, what makes them grow and why molds are a concern. It covers when and how to seek professional help, steps to follow in cleaning up small mold areas, and how to deal with an ongoing problem. In addition, it lists basic steps to prevent mold and reduce mold growth and provides answers to the most frequently asked questions about mold.

Ottawa: Canada Mortgage and Housing Corporation, 2001. (About Your House; CE36) 8 pages

NOTE : Aussi disponible en français sous le titre : Guide sur la moisissure à l'intention des copropriétaires; Votre maison; CF36

STATUS : New Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on CMHC's web site. To download this document visit CMHC's web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

DEFINING PERFORMANCE OF WATER RESISTIVE BARRIERS

Water Resistive Barriers (WRB), also known as sheathing membranes, fulfill many critical functions in the building envelope, but the means to evaluate their field performance has not been adequately developed. This is a pilot project that aims to define the key elements affecting performance of WRB in stucco systems with a view to pursuing the following objectives:

1. Develop adequate experimental characterization of likely WRB field performance.
2. Define WRB characteristics needed for input into advanced Heat Air and Moisture (HAM) models.
3. Examine probable long-term performance of WRB and in particular, study the effect of chemical leaching from stucco products and wood based materials.
4. Compare the results of wetting and drying predicted by advanced HAM models with experimental results.

It is expected that helping manufacturers and users of breather-type moisture barriers define the performance of such materials in both conventional and rainscreen walls will lead to better differentiation between applications of different WRB products as well as in development of new products.

Project participants include CMHC, the Homeowner Protection Office of BC, E.I. Dupont de Nemours Inc., Fortifiber Corporation, HAL Industries and Concordia University.

CMHC Project Officer : *Silvio Plescia* — ***CIDN*** : 2490 0200001

Division : Research Division — ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available — *** NEW ***

GUIDELINES FOR MOISTURE MANAGEMENT IN EXTERIOR WALL SYSTEMS

CMHC is providing financial and technical support to NRC/IRC to develop guidelines for moisture management strategies for exterior wall systems. The guidelines will address user requirements for long-term performance and durability of wall systems for the wide range of climate zones across North America.

CMHC Project Officer : *Silvio Plescia* — ***CIDN*** : 2199 0200001

Division : Research Division — ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

GUIDELINES FOR THE MEASUREMENT OF MOISTURE CONTENT IN FRAMED LUMBER

The objective of this project is to prepare a guideline document or protocol for the proper use of moisture measurement tools in measuring the moisture content in a framed wall lumber assembly. The document will outline a process of how to take moisture readings, where to take moisture readings and how the moisture readings are corrected for temperature and wood species. In addition, the document will provide a general discussion about assessing the overall moisture content of the wood framed assembly.

CMHC Project Officer : *Silvio Plescia* — ***CIDN*** : 2398 0200001

Division : Research Division — ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

IMPROVEMENTS TO THE MOISTURE PERFORMANCE OF PRESERVED WOOD FOUNDATIONS

Previous work by Forintek, the wood industry research agency, has established that the bottom plate of preserved wood foundation walls is very often over 20% moisture content. The wood preservatives generally prevent this relatively high moisture content from causing any degradation in structural strength. However, it is possible that the wet plate will transfer moisture to the insulated cavity above. This may lead to the development of mold in the wall cavity. The objective of this research project is to retrofit a mold troubled Ottawa area preserved wood foundation to validate a practice for reducing a high moisture level and mold within the PWF cavity. The demonstration house has been modified by using fans to ventilate the lower part of the wall cavities. Monitoring of wood moisture levels will continue through 2001. A report on the findings is being prepared in the fall of 2001.

CMHC Project Officer: *Don Fugler*
CIDN : 2419 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

MOLD CLEANUP PROCEDURES: CONTRACTORS' GUIDE

A draft document for professionals on Mold Cleanup Procedures is under development by CMHC. The focus of the document is on information required by contractors involved in renovation and clean-up of mold contaminated houses. As a result of rapidly evolving knowledge in this field, the current draft of the document and its mold cleanup procedures are now being revised to incorporate more current and substantive information from authoritative sources. This document will address mold cleanup in general and will include information on the precautionary measures required to protect workers and occupants, and present best practices for mold remediation. A significant change in approach since preparation of the original draft is the expert consensus that mold remediation should be approached from the perspective of the size of visible mold area rather than the type or toxicity of the molds present.

CMHC Project Officer: *Ken Ruest*
CIDN : 2380 0200
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

MOLD IN HOUSING: AN INFORMATION KIT FOR FIRST NATIONS COMMUNITIES

The information in this kit will assist First Nations communities to recognize when there is a mold problem and to take the necessary steps to deal with the problem. This kit is intended for:
- technical service providers (inspectors) ;
- First Nations housing departments -- housing coordinators and maintenance staff;
- bands -- band managers, housing providers;
- health providers -- community health nurses/representatives and environmental health officers;
- occupants; and
- trades -- builders, contractors and renovators.

Mold is a widespread and common problem in houses anywhere, both in and outside First Nations communities. It can be a minor nuisance or it can have major effects on the occupants.

Mold in houses does not happen overnight. The solutions are also not immediate. A strategy needs to be adopted that includes responding to existing situations, preventing future problems and planning new construction. The responsibilities of the key players and their training needs are identified in this kit.

MOISTURE AND MOLD

The first part of this kit (chapters 1 to 5) is basic information. It is written for occupants. The second part (chapters 6 and 7) clarifies the responsibilities of the key players and identifies the training they need. The third part (chapters 8 to 17) deals with specialized topics and is directed to housing providers.

Ottawa: A joint publication of Canada Mortgage and Housing Corporation, Health Canada, and Indian and Northern Affairs Canada, Assembly of First Nations Housing Secretariat, 2001. 91 pages

Note: Publié aussi en français sous le titre : La moisissure dans les logements : Trousse d'information pour les collectivités des Premières nations

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

NORTHERN HOUSING

COMPARISON OF NORTHERN HOUSING COSTS

This project will outline all components associated with the production of a northern home - from soft to hard, at both the house level and community level to determine which elements, in which locations are inordinately skewing costs. Use of direct data from northern communities will verify these costs. Index communities will allow for comparison of costs between northern communities, and between the North and South. The operationalized database will permit future tracking and analysis such as life cycle performance costs; where use of local labour, indigenous materials and value-added processing of raw, local materials can be developed or expanded to reduce housing costs; and where capacity building may be of benefit.

CMHC Project Officer : *Aleta Fowler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2370 0200003
STATUS : Ongoing

CONTINUATION OF NORTHERN VENTILATION STUDY

This project is a continuation of related CMHC research into ventilation needs and performance in northern homes. Adequate, appropriate and affordable means of ventilation and verification of manufacturer's claims need to be assessed, using an established, consistent methodology. Practical and effective options for ventilation are needed to alleviate potential health problems and building damage. The report will be completed in 2002.

CMHC Project Officer : *Aleta Fowler*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2420 0200002
STATUS : Ongoing
*** NEW ***

INNOVATIVE FOUNDATIONS, HEATING & VENTILATION

This R&D&C (research, development, commercialization) project and first stage monitoring is complete. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

STATUS : Completed

AVAILABILITY : Product is not yet available

MONITORING OF THE NORTH ON-SITE WASTE WATER RECYCLING MICROSYSTEMS

Two microsystems were installed in N'Dilo, NWT in the summer of 1998. These microsystems were adapted from the Toronto Healthy House model for Cold Climate application. Monitoring since installation has allowed for fine-tuning and collection of reliable data. In turn, this has proven the microsystems as economical, viable and as one of the most environmentally responsible ways in which to handle water consumption and waste water disposal. Additionally, health benefits to the occupants have been observed through upgrading of water availability and use. Based upon this data, these systems are now in place, or scheduled for placement in 5 northern communities and have been marketed successfully internationally. Partners in this project include NWT Housing Corporation, GNWT's Department of Resources, Wildlife and Economic Development, Stanton Regional Health Board, Synergy Solutions and the Dene Housing Authority of Yellowknife. Three years of monitoring data will be compiled into a report in late 2001.

CMHC Project Officer : Aleta Fowler ***CIDN*** :

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available *** NEW ***

NORTH ABOUT YOUR HOUSE SERIES

The North About Your House series is a series specifically designed around day to day northern solutions as well as innovative northern models of building practices which work under cold climate conditions. This series compliments the more in-depth North Research Reports. In this series you will find examples of how to use structural panels in the high arctic, means to cleanse wastewater in the North as well as demonstrated ways of constructing a roof which can withstand northern conditions and how to choose a foundation system which will work in any of the northern communities. Upcoming, expect articles on how to solve common northern problems such as preventing vent stacks from freezing, how to keep your trucked water tank clean and how to reduce your utility costs through alternative means of energy production. The "North" series presently includes:

- Building with Structural Panels - Repulse Bay
- On-Site Wastewater Reclamation Systems for the North
- Eagle Lake Healthy House
- Residential Foundation Systems for Permafrost Regions
- Snowshoe Inn, Fort Providence Co-Generation Model
- Arctic Hot Roof Design

STATUS : New Completed Fact Sheets

AVAILABILITY : CMHC Information Products and available on CMHC's web site. To download this document visit CMHC's web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

NORTH WEB-SITE

The purpose of this partnership project is to renovate the former NoRTH web site and maintain this updated dedicated NoRTH web-site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, NWT Housing Corporation, University of Alaska (Fairbanks), NRCan and Yukon College. The web-site will include relevant technical information such as factsheets of research reports and the Frostline newsletter. It will also includes discussion groups to provide a means of ongoing and current communication. The web-site will supply links to other relevant web-sites and will be able to be visited at www.NoRTH-RTHN.org. Alaska Housing Finance Corporation will retain a person to post the backlog of articles, to recruit new material needed by northern audiences, implement the planned next steps such as negotiating links to critical sites, creating a chat room format, etc. and respect the need by CMHC and NRCan to retain their harmonized "look" and post their materials in both French (supplied by CMHC and NRCan) and English. Renovation will be completed in calendar year 2001.

CMHC Project Officer : Aleta Fowler ***CIDN*** : 2369 0200

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet on the web

NORTHERN HEALTHY HOUSE DEMONSTRATION

A demonstration Healthy House is being planned in northern Canada. This Yellowknife demonstration builds upon a long line of research and is the necessary step in illustrating Healthy House (HH) principles and practices. This demonstration will allow interested parties to view the performance and use of Healthy Housing components, permit informed choices for applications in the North, nationally and internationally, and encourage more widespread adoption of Healthy House and "better" housing and community models. The Demonstration will include an "educational" component and will be open to the public upon completion of construction in 2002.

CMHC Project Officer : Aleta Fowler ***CIDN*** :

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

NORTHERN HEALTHY HOUSE FEASIBILITY STUDY

The North has proven itself receptive to Healthy House components as demonstrated by the success of the adoption of microsystems in numerous communities. The North is at a critical juncture with de-evolution of housing responsibility to the community level. Many communities are debating primary housing and infrastructure issues. This project identifies all Healthy House components, with each of their options, to allow communities to make choices based upon their specific circumstances. The draft feasibility report was produced in the Spring of 2001; the final version will be available in calendar year 2001. NWT Housing Corporation and Arctic Energy Alliance will be producing a mixed use Demonstration Project with CMHC. Planning is underway based upon the feasibility draft; construction will commence in 2002.

CMHC Project Officer : Aleta Fowler ***CIDN*** : 2368 0200002
Division : Research Division ***STATUS*** : Planned
AVAILABILITY : Product is not yet available

RESIDENTIAL FOUNDATION SYSTEMS FOR PERMAFROST REGIONS

Permafrost underlies all of the Yukon, Northwest and Nunavut Territories and much of the northern portions of the provinces, especially Manitoba and Quebec. Frozen ground conditions can have significant adverse effects on structures in the North. The effects of settlement and frost heaving commonly result in the premature deterioration of residential structures. Problems related to foundation design and construction can be reduced to a minimum if care is taken in the selection of suitable sites and appropriate foundation systems.

This project is a study on foundation systems for use in northern permafrost and intermittent permafrost areas. The study assembled, documented and analyzed all data possible from literature searches and from the field on all known foundation systems used in the North. The final report includes a decision making tree to enable communities, homeowners, builders and renovators to make informed and appropriate choices in foundation systems.

Prepared by AGRA Earth & Environmental Limited. CMHC Project Officer: Aleta Fowler. Ottawa: Canada Mortgage and Housing Corporation, 2000.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

UPDATE THE NORTHERN UTILITY COSTS REPORT

In 1995, the NWT Housing Corporation commissioned one of the most useful reports for the North, "Utility Costs in Public Housing". It covered every community in NWT (and in, what is now, Nunavut) outlining the subsidized and unsubsidized rates for water and sewer, electricity and heating. Average cost break-outs were calculated for each region and the percentage of monthly costs allocated toward each utility was measured. This report has been instrumental in justifying and strongly illustrating the cost savings of new technologies such as on-site waste water recycling microsystems. CMHC is updating this utility cost report to expand upon four additional aspects:

- inclusion of the entire North: Labrador, Nunavik, Nunavut, NWT and Yukon.
- the source of electricity (hydro, diesel generator) and whether it is a franchise or not
- the source of heating fuel (oil, wood, propane, natural gas)
- a separate category including access to phone and Internet service

The updated report will be available in 2001.

CMHC Project Officer : Aleta Fowler — ***CIDN*** : 2467 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

USE OF COMPRESSED-AIR-FOAM TECHNOLOGY FOR FIRE PROTECTION OF HOUSING IN THE NORTH

The high cost of northern housing, and housing insurance, may justify the installation of fixed automatic fire suppression systems. Conventional sprinkler systems require more water than is presently available in buildings and would entail substantial re-design. Further, although sprinkler systems may allow some occupants of the building time to exit, and may allow time for fire fighters and equipment to arrive, water damage in suppressing the fire usually damages the building beyond reasonable repair. The National Research Council of Canada (NRC) has developed a compressed-air-foam (CAF) system which uses 10% of the water required by conventional sprinkler systems. Further, it is designed to extinguish, not just contain or suppress, fires. This study is a partnership project. It will look at the preliminary feasibility of the design of a self-contained CAF system for a building (optimal CAF piping and discharge), assessment of the water requirements for the CAF system, and the development of appropriate CAF nozzles.

CMHC Project Officer : Aleta Fowler — ***CIDN*** : 2311 0200002
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

USE OF ON-SITE WASTE WATER RECYCLING MICROSYSTEMS FOR SPRINKLER SUPPLY

With microsystem technology, excess water of "swimming pool" quality is constantly produced which must be periodically pumped away, or disposed of on-site. This excess water could be easily stored for sprinkler use. In the North, loss of life due to fire is 10 times higher than in the South. Building loss, when a fire occurs, is nearly 100%. Most communities rely upon volunteer fire departments and upon reservoirs which have limited capacity. Alternatives are needed and this study will determine the means and feasibility of taking this next step. The report is expected in early 2002.

CMHC Project Officer : Aleta Fowler — ***CIDN*** : N/A
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

NORTHERN HOUSING

YUKON FLEX/HEALTHY HOUSING DEMONSTRATION

Yukon Housing Corporation (YHC) is developing a mortgage incentive program for people who choose to incorporate Flex and Healthy Housing features into their homes. CMHC is partnering with YHC to develop a Demonstration Home which illustrates use of these features and documents the decision-making points, the regulatory issues, the design and construction processes, and the final user reactions. The home will be open to the public for observation as well. Construction is planned for summer 2002; the home will be open to the public shortly thereafter, concurrent with publication of the report documenting the Demonstration.

CMHC Project Officer : *Aleta Fowler* ***CIDN*** : 2469 0200001

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

SEE ALSO: - Evaluation of the Measurement of Housing Need in Northern and Remote Communities, p. 106

- Alternative Home Energy Sources for the North, p. 22
- Design Multiple Unit CHUM's and Modular House Packages, p. 49
- Northern Heating and Ventilation Systems, p. 29

PROPERTY MANAGEMENT

TECHNICAL AUDIT COURSE FOR PROPERTY MANAGERS

This project aims to develop a course for property managers on the technical audit of high-rise residential buildings. Using a building as a system approach, this course will provide property managers and building owners with a perspective of the interaction of all building systems and components. Such training is not available to residential property managers in Canada. Technical audits, an organized review of building systems, are an effective way to assess the condition of a building, to understand how the building is performing and to provide a sound basis for making maintenance, repair and upgrade decisions. The course provides the property manager with insights into the technical audit process and highlights the requirements for undertaking technical audits of residential buildings including the scope of the work, the consultant qualifications. The course also introduces the fundamental principles of building science to encourage holistic solutions to building problems.

CMHC Project Officer : *Silvio Plescia* ***CIDN*** : 2297 0200001

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

RENOVATION AND INSPECTION

ABOUT YOUR HOUSE - HIRING A HOME INSPECTOR

The purpose of this project is to produce a four to six page fact sheet on "Hiring a Home Inspector". The fact sheet would be included in the About Your House series and would offer helpful guidance to consumers on questions to ask and what to look for when in the market for a qualified home inspector. The fact sheet would be done in consultation with the private home inspection industry through members of the Canadian Association of Home and Property Inspectors (CAHPI) as well as through home and property inspector members of the Canadian Home Inspectors and Building Officials committee. The fact sheet will include information on, but not be limited to, the following:

- current situation (who is out there and what regulations exist)
- CAHPI's national initiative (purpose and objectives)
- services provided by home inspectors and why they are needed
- questions to ask and what to look for when hiring a home inspector
- what to expect (time involvement, cost, written report)

The fact sheet is anticipated to be completed by Fall 2001.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : 2486 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

CANADIAN HOME INSPECTORS AND BUILDING OFFICIALS NATIONAL INITIATIVE

With the successful completion of the first phase of this multiphase project, which was to develop national occupational standards for the private home inspection and municipal building code inspection sectors, the Canadian Home Inspectors and Building Code Officials are now preparing for Phase II which is to use the occupational standards to:

- conduct a gap analysis to identify any curriculum and training needs;
- develop curriculum and training programs to meet their needs;
- identify a certification and accreditation model that could be adopted for their industry sectors;
- establish an accreditation program for institutions delivering training programs.

Following the completion of Phase II, the two sectors should be in a position to implement the certification programs for their respective industry sectors under Phase III. This project is supported by the private and public inspection industry sectors, Human Resources Development Canada and CMHC.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : 1962 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : The occupational standards can be obtained through the industry sectors, i.e. Alliance of Canadian Building Officials Association and the Canadian Association of Home and Property Inspectors, or on loan from the Canadian Housing Information Centre

CMHC SPONSORED FEASIBILITY STUDY ON USING THE PRIVATE HOME INSPECTION INDUSTRY TO COLLECT DATA ON THE PHYSICAL CONDITION OF CANADA'S EXISTING HOUSING STOCK

The purpose of this project was to conduct a feasibility study on the use of the private home inspection industry nationally as a vehicle for gathering data on housing characteristics and physical conditions. The study investigated the type of information desired by CMHC and the type of information currently being gathered by the inspection industry. The study considered the various reporting systems being used, the numbers and types of homes inspected annually, geographic coverage, reliability of the information, anticipated costs, confidentiality requirements, use limitations and potential contractual arrangements for obtaining this and other data for CMHC's purposes. The final report for this study is complete. Next steps involve an investigation of similar interests by other groups and departments, internal and external to CMHC to consider the possibility of undertaking a coordinated data collection project.

Prepared by Applegate Ventures Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Darrel Smith. Ottawa: CMHC, 2001. 112 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

FEASIBILITY STUDY FOR A HERITAGE RENOVATION ASSISTANCE SERVICE, LAC-SAINT-JEAN HISTORICAL SOCIETY, ALMA, QUEBEC = ÉTUDE DE FAISABILITÉ SUR UN SERVICE D'AIDE À LA RÉNOVATION PATRIMONIALE, SOCIÉTÉ D'HISTOIRE DU LAC-SAINT-JEAN, ALMA (QUÉBEC)

This case study documents the work of the Lac-Saint-Jean Historical Society which received an A.C.T. grant to study the feasibility of establishing a "Heritage Renovation Assistance Service". This Service is targeted at those involved in the renovation process and provides both do-it-yourself and professional home renovators with a comprehensive and easy-to-understand source of information on acceptable renovation techniques and materials. The case study report describes the project's aims and results, and the community and key players involved. The benefits resulting from the Service are described as well as how this type of service would be useful to renovators in other municipalities.

Case study written by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 38 pages

Order Number: 61994

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

GUIDE FOR THE HEALTHY RENOVATION OF A ONE STOREY HOUSE CIRCA. 1960-1979

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of bungalow-style houses built between 1960-1979. The advice considers occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. The publication will include case studies of common renovations to this style of house. The guide will resemble the initial publication in this series which describes appropriate renovations to 1½ storey houses. The report is being prepared for publication.

CMHC Project Officer : *Don Fugler*

CIDN : 2202 0200001

Division : Research Division

STATUS : Ongoing

AVAILABILITY : Product is not yet available

HIRING A CONTRACTOR. ABOUT YOUR HOUSE; CE26A

At some time, most homeowners will hire someone for repairs or renovations. Even a homeowner experienced in home repairs may have to hire a contractor because of the size or level of difficulty of the job. This fact sheet helps homeowners choose a contractor and work effectively and fairly with the chosen contractor. Topics covered include getting estimates, writing a contract, paying for the work, consumer protection laws, and insurance.

Ottawa: Canada Mortgage and Housing Corporation, 2001. (About Your House; CE26a) 6 pages

NOTE : Aussi disponible en français sous le titre : Choix d'un entrepreneur. Votre maison; CF26a

STATUS : New Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on CMHC's web site. To download this document visit CMHC's web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

MANDATORY HOME INSPECTIONS ON RESALE HOMES IN ONTARIO

A CMHC External Research Program (ERP) grant has been awarded to research the issue of mandatory home inspections for resale homes in Ontario with a number of housing industry interest groups. The results will be an attempt to determine why this requirement was never imposed in the past, the pros and cons of enacting such a requirement in the future, and how could such a requirement be enacted and by whom. The study will also investigate if the existing home inspection industry could handle the increased capacity of such a requirement. The research is anticipated to be completed by early 2002.

CMHC Project Officer : *Darrel Smith*
CIDN : 2437 0200015
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available
*** NEW ***

NATIONAL RENOVATORS' TRAINING PROGRAM - REVISION 2000

The purpose of this project is to revise and amend the course content and format of CMHC's National Renovators' Training Program. As discussed with the Canadian Renovators' Council, this work will implement the short-term and long-term improvement recommendations presented in the CMHC report Renovator Training in Canada: Current Situation and Future Strategies. One significant revision will allow for the course to be presented effectively in two phases, with five three hour modules in each phase. An optional schedule will also be included to permit delivery of the program in shorter, evening sessions. The revision is underway and the manuscript should be completed by October, 2001.

CMHC Project Officer : *Darrel Smith*
CIDN : 2387 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

PRIORITIZED PRACTICAL APPROACHES FOR ESSENTIAL REMEDIATION, REPAIR AND MAINTENANCE PROJECTS

The purpose of this project was to identify and prioritize essential remediation work which must be completed before undertaking common renovation projects. Information has been produced in twelve independent fact sheets on how to identify the prioritized work, consequences of not doing the work, practical solutions, and benefits. This information will be useful to homeowners to help them prioritize essential repair work either in isolation or as part of a renovation project. The information can also be used by renovators as a tool to help convince homeowners of other essential repairs which need to be corrected as part of a renovation project when applicable. These twelve "Before You Renovate" fact sheets include the following titles:

- Assessing the Renovation Project. About Your House Series; CE 28a
- Before You Start Renovating Your Basement - Structural Issues and Soil Conditions. About Your House Series; CE 28b
- Before You Start Renovating Your Basement - Moisture Problems. About Your House Series; CE 28c
- Before You Start Renovating Your Kitchen. About Your House Series; CE 28d
- Before You Start Renovating Your Bathroom. About Your House Series; CE 28e
- Before You Start Window and Door Renovations. About Your House Series; CE 28f
- Before You Start Repairing or Replacing Roof Finishes. About Your House Series; CE 28g
- Before You Start Repairing and Replacing Materials -- Exterior Walls. About Your House Series; CE 28h

- Before You Start an Energy Efficient Retrofit -- Mechanical Systems. About Your House Series; CE 28i
- Before You Start an Energy Efficient Retrofit -- The Building Envelope. About Your House Series; CE 28j
- Before You Start Assessing the Comfort and Safety of Your Home's Mechanical Systems. About Your House Series; CE 28k
- Before You Start a New Addition. About Your House Series; CE 28L

Ottawa: Canada Mortgage and Housing Corporation, 2001.

STATUS : Completed Fact Sheets

AVAILABILITY : CMHC Information Products and available on the Internet at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

RECYCLE: LIFECYCLE - HOW TO RENOVATE A HOME FOR CHANGE

This project's objective is to provide a set of design strategies for adaptable renovations involving a variety of common, detached housing types. The goal of these strategies is to inform homeowners, or prospective homeowners, of ways to achieve the greatest flexibility through alterations and additions to their houses to meet their changing needs.

CMHC Project Officer : *Thomas Parker* ***CIDN*** : 2437 0200014

Division : External Research Program ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available *** NEW ***

REVISION OF HOME CARE: A GUIDE TO REPAIR AND MAINTENANCE

The purpose of this project is to do a major update and revision of Home Care: A Guide to Repair and Maintenance. As part of the revision, the publication titled New Life for an Old House, which is no longer in print, would also be reviewed and where appropriate the information on home repair would be incorporated into Home Care to produce one comprehensive home maintenance and repair guide. The revised publication will include information from recent research and more specifically on topics including; home inspection, home repair (not renovation), home maintenance, Healthy Housing and FlexHousing tips, and how to hire a contractor, as part of the update. The content will emphasize Canadian issues whenever possible to differentiate it from similar American products. The revised manuscript is anticipated to be completed early 2002.

CMHC Project Officer : *Darrel Smith* ***CIDN*** : N/A

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available *** NEW ***

SAMPLE RENOVATION CONTRACT. ABOUT YOUR HOUSE; CE26B

The purpose of this project was to produce an About Your House fact sheet on a Sample Renovation Contract. The fact sheet includes an example of a contract to illustrate what should be included in a contract when undertaking renovation work. It also includes a commentary to explain what and why the various aspects of a contract are important. The Canadian Home Builders' Association (CHBA) participated on the review committee for this project.

Ottawa: Canada Mortgage and Housing Corporation, 2001. (About Your House; CE26b) 12 pages

NOTE : Aussi disponible en français sous le titre : Modèle de contrat de rénovation. Votre maison; CF26b

RENOVATION AND INSPECTION

STATUS : New Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on CMHC's Web site. To download this document visit CMHC's Web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

CANADIAN HOMES AND CLIMATE CHANGE

The object of this research is to create a guide for consumers on Canadian homes and climate change. The guide, in the form of a questionnaire, will help consumers identify where they can make changes in their activities and households to minimize their greenhouse gas creation. CMHC will contribute the Guide as part of the broadly based, national social marketing initiative to reduce climate change. A draft questionnaire has been prepared and published in various publications. The questionnaire was redrafted for easier use but the poor user response to the questionnaire suggests that more revisions are required.

CMHC Project Officer : *Don Fugler* ***CIDN*** : 2120 0200001

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

CONSTRUCTION RESOURCE MANAGEMENT COURSE - PHASE II

A private and public sector consortium was established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. The partners included; Department of National Defense, Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, and PCL Constructors Canada Inc. Phase I was the development of a CRD training course in hard copy. The course provides practical and comprehensive information on resource management issues in the Canadian CRD industry. It is intended for project managers which include, but are not limited to: engineers, architects and CRD contractors. Phase II consisted of the development of an Internet based CRD project management course that would: provide current resource management information and case-specific solutions; contribute to the development of standard managerial practice; promote widespread communication of the best resource recovery techniques, contribute to economic growth and job creation; promote long-term behavioural change; and help industry associations and government departments meet mandated environmental targets.

STATUS : Completed

AVAILABILITY : To obtain more information on the CRD Course please contact Vince Catalli at byDesign Consultants (613) 759-4605 or at www.bydesignconsultants.com.

DEVELOP A SET OF ENVIRONMENTALLY SUSTAINABLE SITE AND BUILDING DESIGN, CONSTRUCTION AND OPERATION GUIDELINES FOR SINGLE AND MULTI-FAMILY UNIT HOUSING, MOTELS AND HOTELS FOR THE TOWN OF BANFF

The purpose of this project is to develop a set of environmentally sustainable site and building design, construction and operation guidelines for single and multi-family unit housing, motels and hotels for the Town of Banff in a manner which could be used to inform the development of similar guidelines for other communities across Canada.

CMHC Project Officer : *Doug Pollard* ***CIDN*** : 2309 0200001

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

ECOPERTH: A SMALL RURAL COMMUNITY TAKES ACTION ON CLIMATE CHANGE

By communicating the experience of Perth, Ontario, this project shows how a small rural town can respond to the issues of climate change. The planning and implementation of many initiatives of EcoPerth, a community-based project, are described. The initiatives fall into four categories: The Green Team (planting trees, naturalizing the land and promoting local food), the Building Team (use less energy at home, work and play), the Transportation Team (finding innovative ways to simply get around) and the Communication Team (Getting the word out and moving from awareness to action).

Ottawa: Canada Mortgage and Housing Corporation, Research Division, 2001. (Research Highlights. Socio-economic Series; no. 82 (5 pages)

Order number: 60975

Publié aussi en français sous le titre : EcoPerth : une petite collectivité rurale réagit contre le changement climatique

STATUS : New Completed Research Highlight
AVAILABILITY : Product is available on the web

IMPLEMENTING SUSTAINABLE COMMUNITY DEVELOPMENT: CHARTING A FEDERAL ROLE FOR THE 21ST CENTURY

This research was undertaken to accelerate the implementation of sustainable communities in Canada and was designed to answer the following key questions:

- What are the essential features of sustainable community development?
- Why is sustainable community development so important to the future economic, social and environmental health and well being of Canadians?
- What is the current status of sustainable community development in the US, Europe, Australia, New Zealand and Canada, and more importantly, what are federal governments doing to support these innovative developments?
- What are the primary barriers to sustainable community development in Canada?
- What types of policy and program measures could the federal government implement in partnership with municipal governments and others to effectively stimulate the implementation of sustainable communities in Canada?

This report is written primarily for federal policy makers who are interested in promoting sustainable development and reducing greenhouse gases at the community level. However, it also provides resources for other practitioners - innovative developers, development consultants, planners and municipal, regional and provincial policy makers - who are also interested in implementing sustainable communities.

Information on "good practices", examples of the major features of sustainable communities and possible questions for assessing development proposals are provided. Five detailed case studies on successful and unsuccessful sustainable communities and included lessons learned with practical advice on marketing and financing are provided. Pictures and graphics illustrating the major features of sustainable communities are used throughout the report.

Prepared by P & A Peck & Associates. Written by Steven Peck, Ray Tomalty, Anna Hercz and Guy Dauncey. Prepared for Canada Mortgage and Housing Corporation and Natural Resources Canada. CMHC Project Officer: Doug Pollard. Ottawa: Canada Mortgage and Housing Corporation, 2000.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

LIVING BY WATER GUIDEBOOK

The objective of this project is to prepare, publish, market and distribute a guidebook for waterfront residents on reducing environmental impacts of housing on aquatic and shoreline habitat.

CMHC Project Officer : *Susan Fisher*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2040 0200001
STATUS : Ongoing

PRACTICES FOR SUSTAINABLE COMMUNITIES

"Practices for Sustainable Communities" presents:

- A framework to identify and organize the practices --- the tools, strategies and activities -- that lead to greater sustainability; and
- Examples of sustainable community development practices.

This book makes the idea of sustainable development a practical reality. It is a Canadian view of the challenges of sustainability, with made in Canada case studies and solutions.

Included with the publication is SCIP, the Sustainable Community Indicators Program, developed by CMHC and Environment Canada. SCIP helps communities measure their progress in building and living sustainably. Communities can create a locale vision of sustainability and measure and monitor their progress in making that vision a reality.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 176 pages

Order number: 62160 **Price: $59.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Pratiques pour des collectivités durables

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

RESIDENTIAL GREENWAYS IN TRANSITION: FOUR DECADES OF EXPERIENCE IN WATERLOO

This research describes Waterloo's Beechwood greenway system during its four decades of change in conjunction with municipal policies for urban residential development. It examines the types of greenway issues and conflicts that have occurred and reviews means for resolving them. It documents and assesses major stakeholders' satisfaction with greenway planning objectives and outcomes. Finally, it assesses the current and potential contributions of greenways in achieving measures of urban sustainability.

This report makes Waterloo's experience available to other municipalities wanting to initiate greenway programs or wanting to improve the role of existing greenway programs within the planning mandate.

Prepared by Larry R.G. Martin. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Susan Fisher. Ottawa: CMHC, 2001. (External Research Program Report) 57 pages

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

SOIL AND FLORA RESTORATION AFTER GROUND DISTURBANCE

This research will examine local soils and indigenous plants in the North to arrive at a means for restoring healthy ground cover after disturbance (such as construction), at the least cost. In the North especially, ground cover loss exacerbates erosion of buildings, roadways and community infrastructure. Soil damage due to exposure leads to summer dust which deteriorates building exteriors and heating systems; impedes the operation of windows and doors; and affects the health of both the occupants and the community at large. Ground cover damage is also one of the leading factors for the break-down of permafrost. This study has the possibility for developing entrepreneurial opportunities and will be of interest to communities, health care providers, northern housing providers as well as to other northern countries. The final report will be available in early 2002.

CMHC Project Officer : *Aleta Fowler* ***CIDN*** : 2311 0200002

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

**** SEE ALSO:** - Building Communities: First Nations Best Practices for Healthy Housing and Sustainable Community Development, p. 13

- Demonstration of Healthy Housing on Reserve, p.14
- Norhern Healthy House Demonstration and Feasibility Study, p. 59-60
- Yukon Flex/Healthy Housing Demonstration, p. 62, and
- The Socio-economic Sustainable Development & Healthy Housing Section, p. 123-127

WATER CONSERVATION, REUSE & MANAGEMENT

CASE STUDIES OF WATER CONSERVATION INITIATIVES IN MULTIS

CMHC, in partnership with City of Toronto Better Buildings Partnership, will document case studies of water conservation retrofits for multi unit residential buildings. The building profile, water conservation measures, costs and resulting water and energy savings will be described. The studies will serve as examples to encourage water use efficiency in other building and will appear on CMHC's website.

CMHC Project Officer : *Catherine Soroczan* ***CIDN*** : 2239 0200

Division : Research Division ***STATUS*** : Ongoing

AVAILABILITY : Product is not yet available

DOMESTIC COLD WATER BOOSTER PUMP CONTROL MONITORING PILOT PROGRAM = LE PROGRAMME PILOTE DE CONTRÔLE POUR POMPE RELAIS À EAU FROIDE DOMESTIQUE

This pilot study, in partnership with the City of Toronto, Minto, and CMHC assessed the performance of two different booster pump control systems in 7 multi-unit residential buildings. Booster pump performance was measured in terms of electrical energy and water savings. The study assessed the impact of booster pump savings on buildings retrofitted with water efficient fixtures to ensure that only the technology application is measured without the influence of other concurrent changes. By utilizing 7 buildings with different characteristics, (size, # units, occupancy type), the work also attempted to define what type of building profile will most benefit from utilizing this control system. The final report findings indicate that greatest impact is felt with respect to energy savings. Water savings are best achieved through a leak detection and appliance retrofit program.

Prepared by Alain Lalonde, Veritec Consulting Inc. and Andrew Pride, Minto Energy Management. Prepared for Minto Developments Inc., in cooperation with City of Toronto and Canada Mortgage and Housing Corporation. CMHC Project Officers: Cate Soroczan and Sandra Baynes. Ottawa: CMHC, 2001. 1 CD-ROM

NOTE: No. 01-118 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

STATUS : New Completed CD-ROM and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

DUAL FLUSH TOILET PILOT PROJECT

CMHC is working with a number of municipalities across the country to conduct a pilot program for dual flush toilet systems in a variety of buildings. This study will monitor water consumption and toilet performance as well as customer satisfaction with the dual flush system. Twelve agencies from eight provinces are participating in the project which will see toilets installed in single family homes, multi unit residential buildings, municipal and commercial buildings. These dual flush toilets will be compared to typical 13L and 20L toilets as well as Ultra Low Flow 6L toilets on a consumption and cost basis. Anticipated results of this work will be the increased awareness of dual flush systems across the country, and an improved ability to overcome regulatory, technical, and perceptual obstacles.

CMHC Project Officer : *Catherine Soroczan, Sandra Baynes* ***CIDN*** : 2336 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

ECONOMIC FEASIBILITY STUDY OF WATER REUSE AND TREATMENT TECHNOLOGIES

The purpose of this project is to undertake and complete an economic feasibility study of water reuse and treatment technologies. The contractor will assess ten case studies of on-site water reuse applications. The final draft has been received and the case studies will be uploaded to the CMHC water website on a monthly basis. Further attention is being paid to the financial aspects of water reuse and full costing.

CMHC Project Officer : *Catherine Soroczan* ***CIDN*** : 2089 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

IDENTIFY EXISTING AND EMERGING GREYWATER TREATMENT AND RE-USE TECHNOLOGIES AND TO EXPAND AND REVISE ITS TECHSPEX SOFTWARE TO INCLUDE GREYWATER OPTIONS

This project's objective was to undertake and complete a review of the emerging greywater treatment and re-use technologies and the expansion and review of the TechSpex software to include greywater options.

CMHC Project Officer : *Catherine Soroczan* ***CIDN*** : 1927 0200005
Division : Research Division ***STATUS*** : Completed
AVAILABILITY : There will be no product for this project

MAXIMUM DAY WATER DEMAND REDUCTION MONITORING AND EVALUATION PROJECT

The objective of this project was to identify and implement a water efficiency measure targeted at reducing maximum day water demands and be responsible for all related costs associated with implementing the identified measure - these costs will depend on the measure selected by each Municipality and the method of implementation used. Preliminary results have been received in draft form. Results show that indoor water consumption was reduced for a number of the conservation methods used. A follow-up study commenced Summer 2001 to determine: impact on outdoor water consumption and whether conservation is maintained over a long period.

CMHC Project Officer : *Catherine Soroczan, Sandra Baynes* ***CIDN*** : 2341 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

MAXIMUM DAY WATERING DEMAND PHASE II - ASSESSMENT OF WATER CONSERVATION STRATEGIES

This project's objective is to determine the impact of the Household Guide to Water Efficiency on indoor and outdoor water consumption. Specifically it will seek to address the questions: Is the impact on consumer behaviour maintained in the long term, what effect does the Guide have on outdoor water use during the summer months, and what extra impact does a complementary social marketing campaign have on consumer behaviour. This work is part of the second phase of the Max Day project initiated in 2000, which saw a reduction in consumption rates based on conservation method used. This study is scheduled for completion January, 2002.

CMHC Project Officer : *Catherine Soroczan, Sandra Baynes* ***CIDN*** : 2341 0200003
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

ON-SITE STORMWATER MANAGEMENT ALTERNATIVES

This project's objective was to provide case studies of on-site stormwater management alternatives. These case studies are available on the CMHC water website in case study form.

STATUS : Completed
AVAILABILITY : Product is available on the web

ON-SITE WATER QUALITY MONITORING AND CONTROL SYSTEMS

The objective of this project is to identify, through consultation, the requirements and elements of a long-term monitoring and control system for on-site water reuse technologies which will meet health and environmental regulatory needs, etc.

CMHC Project Officer : *Catherine Soroczan* ***CIDN*** : 1936 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

PERFORMANCE ASSESSMENT OF LOW FLOW TOILETS

This project's objective is to set up and conduct a monitoring program to verify the flush volumes of Ultra Low Flow (ULF) toilets installed in single-family homes as part of Durham's retrofit program. Initial results indicate that depending on the brand of toilet installed there is a mixed reaction to ultra low flow technology. Report to be available December, 2001.

CMHC Project Officer : *Catherine Soroczan, Sandra Baynes* ***CIDN*** : 2416 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

REMOTE MONITORING AND CONTROL OF ON-SITE WASTEWATER TREATMENT, RECYCLING AND RE-USE SYSTEMS

This External Research Project addresses remote monitoring and control of systems for on-site wastewater treatment, recycling, and re-use. Effective, reliable, and long-term performance of even the simplest of these systems requires at least periodic monitoring, and the most sophisticated systems require continuous monitoring and control capability.

There are two objectives to this research:

1. To produce a resource document for multi-stakeholders: planners, managers, regulators etc. who have interests or responsibilities related to systems for on-site wastewater treatment, recycling, or reuse; and
2. To produce a supplementary document that will propose ways in which the contents of that document can be communicated most effectively to those users.

CMHC Project Officer : *Sandra Baynes* ***CIDN*** : 2437 0200020
Division : External Research Program ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

WATER QUALITY MONITORING OF THE TORONTO HEALTHY HOUSE

The purpose of this project is to undertake the collection of water samples along various points from the Toronto Healthy House Water Reuse System and have them analyzed for a number of water quality parameters. Monitoring is underway and is scheduled for completion early 2002.

CMHC Project Officer : *Catherine Soroczan, Sandra Baynes* ***CIDN*** : 2337 0200002
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

YOUR SEPTIC SYSTEM. ABOUT YOUR HOUSE; CE34

This six page fact sheet, designed for the consumer, describes how a septic system works and what to do to keep a septic system well maintained and functioning properly. It covers how to know if a problem with a septic system exists by listing some of the warning signs of a failing system, and then outlines actions required to repair it. In addition, the fact sheet describes available alternatives to septic systems.

Ottawa: Canada Mortgage and Housing Corporation, 2001. (About Your House; CE 34) 6 pages

NOTE : Aussi disponible en français sous le titre : Votre installation d'assainissement. Votre maison; CF34

STATUS : New Completed Fact Sheet

AVAILABILITY : CMHC Information Products and available on CMHC's Web site. To download this document visit CMHC's Web site at: http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/index.cfm

SOCIO ECONOMIC RESEARCH

ADAPTATION OF POTENTIAL HOUSING DEMAND MODEL TO ABORIGINAL COMMUNITIES - AN EXAMPLE

This study will build on the results of a feasibility study that looked at the application of CMHC's potential housing demand model in Aboriginal communities. It will take the recommended actions and apply them to a test case of the Nishnawbe Aski Nations (NAN), a grouping of 49 bands in Northern Ontario. Some specific tasks will be: to monitor the degree of difficulty that NAN administrators encounter in gathering accurate input data, to refine the assumptions on headship rates and household types that will be parameters for the model. Eight communities from NAN will be piloted in a first phase, and if successful, the other communities will follow as Phase 2.

CMHC Project Officer : *Phil Deacon* — ***CIDN*** : N/A
Division : Research Division — ***STATUS*** : Planned
AVAILABILITY : Product is not yet available — *** NEW ***

ALTERNATE ABORIGINAL TRAINING DELIVERY OPTIONS

Experience over the past several years has shown the need to explore alternate approaches to delivery of training to First Nations (FN) communities and other Aboriginal groups. It is proposed that a small study be launched to look at the feasibility of FN and other Aboriginal groups sharing training expertise and resources by a number of innovative techniques, to supplement the more conventional approach.

One possible model is having a FN community which has already received training or built up expertise on its own, provide a "trainer" to another community to demonstrate and teach the relevant members of the second community. A variation on this would be to have the second community send 1-2 of its members to "shadow" the expert for several days or more to fully learn how to implement a given approach, technology, etc.

The study would examine the various possibilities of training sharing, how logistics could work, what sort of recompense the trainer or "training community" should expect, etc. Such a study holds the promise of extending training delivery resources having effective "hands on" training and supporting capacity development.

CMHC Project Officer : *Marcelle Gareau* — ***CIDN*** : 01PLO-8426
Division : Research Division — ***STATUS*** : Planned
AVAILABILITY : Product is not yet available

COMMUNICATIONS & INFORMATION TRANSFER STRATEGY FOR ABORIGINAL GROUPS

The goal of this project is to develop a communications and information transfer strategy that will help CMHC in its interactions with Aboriginal housing groups regarding capacity development, research and information transfer activities. To be effective, information has to reach the audience that matters and be in formats that have the maximum impact.

The study looks at the barriers to finding and using housing related information, what makes housing related information relevant, what are key influences, and how effective are the available communications vehicles and distribution channels, all in regard to Aboriginal audiences.

The project consists of: an assessment of existing communication strategies and marketing research in the area of housing information and training; personal or telephone interviews with senior officials of key national and provincial stakeholder groups; group discussions with a broad range of the key client groups as defined in target audiences; and development of alternative communications and information transfer strategies for CMHC and assessment of their relative costs.

The target audience for this project is made up of: key decision makers in housing operations and policies, provincial organizations chosen to give regional coverage, major national organizations, and regional CMHC program officers.

The geographic coverage is Canada wide. All types of Aboriginal community, on or off-reserve in rural, remote and urban communities are included.

CMHC Project Officer : *Philip Deacon*
CIDN : 2225 0200001
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

DEVELOPMENT OF A SURVEY INSTRUMENT TO STUDY LINKS BETWEEN LIVING ARRANGEMENTS, HOMELESSNESS AND RESIDENTIAL MOBILITY OF URBAN ABORIGINALS: FINAL REPORT

This pilot study provides information about how a survey methodology can be used to identify patterns of residential mobility among urban Aboriginal populations. The objectives of this pilot study were to design and test such a survey methodology, not to support statistically significant inferences for Aboriginal populations in urban centres. A questionnaire was developed and tested with a sample of 144 Aboriginal respondents living in two urban centres --Toronto (73) and Winnipeg (71). The sample included respondents from First Nations (96), Métis (40), Inuit (4) and other Aboriginal groups (4). Fourteen Aboriginal organizations in the two selected cities identified respondents, the majority of whom were women, and participated in the survey administration. Information was gathered between November, 1999 and January, 2000 using in-person interviews, telephone interviews and self-administered questionnaires.

Substantive issues dealt with general topics such as residential migration and mobility, frequency and duration of homelessness, current and projected housing needs, empirical linkages and diversity (gender, income, employment, education) of the study population. Survey design issues dealt with Aboriginal consultations, representative pre-testing, literacy and survey administration methods. Respondents took an average of 35 minutes to complete the pre-test version of the questionnaire. The section on Moves (Migration and Mobility) provided the greatest recall challenge for respondents.

The pilot study demonstrated that details of past moves can be tracked, within limits. The survey tracked up to three moves within a five year time period based on respondent recall. Field team reports indicate this horizon may be the practical limit of accurate recall. Some data quality problems were associated with questions such as changes in household type and size. The pilot survey explored the reasons and motivations behind the moves of Aboriginal people living in urban areas --what some experts characterize as "push" and "pull" factors. While very preliminary, the pilot survey results were broadly similar to the results of the 1991 APS which showed that family, employment, housing and education are the major reasons for moving. The pilot survey also successfully identified reasons for moves, using questions or probes to identify different types of housing-related reasons for moves. Reasons differ for in-city (mobility) versus to-city (migration) moves. Housing was a bigger factor for in-city moves while work and education were more important for people moving across city boundaries.

The pilot survey explored in some detail housing-related reasons for moving such as affordability, better quality, and housing that better suits household needs. Cumulatively, these different housing-related factors were identified by almost two-thirds of respondents as underlying their most recent move. This is much higher than the percentage of respondents to the APS who identified housing as a factor in either migration or mobility.

Prepared by Turtle Island Associates. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Phil Deacon. Ottawa: CMHC, 2000. 92 pages

NOTE: No. 88 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : New Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

EFFECTS OF URBAN ABORIGINAL RESIDENTIAL MOBILITY AND SERVICE PROVISION

This project will examine the effects of Aboriginal urban mobility upon service provision in areas such as housing, education, and health care in both the private and public sectors. The project is aimed at examining the effects of Aboriginal urban mobility upon the provisions of services to Aboriginal people in Winnipeg and Regina.

CMHC Project Officer : *Marcelle Gareau* ***CIDN*** : 2436 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

EXAMINING INUIT SPACE USE IN EURO-CANADIAN HOUSE FORMS

This project is intended as the initial phase of a long term investigation of Inuit spatial behaviour in Euro-Canadian house forms.

CMHC Project Officer : *Marcelle Gareau* ***CIDN*** : 2437 0200019
Division : External Research Program ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

FIRST NATIONS HOUSING PROPERTY MANAGEMENT TRAINING COURSES AND RESOURCES

This project's objective is to undertake and complete the identification and assessment of First Nations housing property management training courses and resources and provide recommendations for a comprehensive curriculum and innovative approaches to delivery in remote communities.

CMHC Project Officer : *Jim Rockwood (ABC)* ***CIDN*** : 2374 1500001
Division : Assisted Housing Division ***STATUS*** : Planned
AVAILABILITY : Product is not yet available

INTERCULTURAL COMMUNICATION OF CMHC INFORMATION PRODUCTS TO THE ABORIGINAL POPULATION

A project will be implemented in order to determine which existing information products are relevant to Aboriginal communities' housing goals. The relevant material will then be reviewed in order to ensure that the presentation of the information is appropriate and accessible to members of Aboriginal communities. The project may include the conceptual reformatting of some existing products if deemed necessary. Relevant material will then be disseminated in a variety of ways such as information mail-outs, faxes and could include the development of an Aboriginal web site on CMHC's web page.

CMHC Project Officer : *Marcelle Gareau* — ***CIDN*** : N/A

Division : Research Division — ***STATUS*** : Planned

AVAILABILITY : Product is not yet available

RESEARCH AND CONSULTATION PROJECT CONCERNING INUIT HOUSING ACROSS CANADA: FINAL REPORT

The purpose of this project was to develop a more current understanding of housing problems and priorities in Inuit communities, investigate and identify "best practices", and develop a housing strategy which will include innovative new means of financing and alternative forms of housing, recognizing that there is no funding for new housing commitments off-reserve through Canada Mortgage and Housing Corporation (CMHC). The project was jointly funded by CMHC and the Department of Indian Affairs and Northern Development.

Prepared by the Inuit Tapirisat of Canada. CMHC Project Officer: Line Gullison. Ottawa: Canada Mortgage and Housing Corporation, 2001. 52 pages

NOTE : Aussi disponible en Inuktitut et en français sous le titre : Projet de recherche et de consultation sur le logement des Inuits au Canada : rapport final

STATUS : New Completed Report

AVAILABILITY : Canadian Housing Information Centre

URBAN ABORIGINAL MOBILITY COLLOQUIA/WORKSHOPS/SURVEY PLANNING

The 2001 work is preparation for a possible survey in 2002 that will be definitive in terms of measuring detailed mobility of urban Aboriginal households. This activity will involve:

1) a project to develop an action plan for a quantitative study of mobility and the necessary resources (funding, partners, access to data, etc.)
2) a series of workshops and colloquia will be held to generate interest and commitment on the part of potential funding partners of the survey.

CMHC Project Officer : *Marcelle Gareau* — ***CIDN*** : N/A

Division : Research Division — ***STATUS*** : Planned

AVAILABILITY : Product is not yet available — *** NEW ***

ABORIGINAL HOUSING

URBAN ABORIGINAL PERCEPTIONS OF ACCESS TO HOUSING

The objectives of this project are:

1) To obtain baseline data on the nature and extent of discrimination in housing that Aboriginal people experience - case studies focus on Winnipeg and Thompson, Manitoba.
2) To quantitatively and qualitatively examine the key variables associated with housing discrimination for Aboriginal people, including such factors as residential migration/mobility, social cohesion, and ethnic clustering.
3) To explore the effect that discrimination in housing for Aboriginal people has with regard to other victimization. This will be done by comparing the housing related factors to a more general survey of victimization (National Community Victimization Project) being carried out by Simon Fraser University with a SSHRC grant.

CMHC Project Officer : *Phil Deacon*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1990 0200001
STATUS : Ongoing
*** NEW ***

**** SEE ALSO:** p. 13-14

CHILDREN'S ENVIRONMENTS

HOUSING CANADA'S CHILDREN

This study looks at children and the families in which they are raised, in the context of their environments. It presents a number of facts about Canadian households with children that describe their make up, the types of housing in which they live and their tenure arrangements. It also draws attention to the probable links between housing environments and children's development outcomes.

Overall, the findings of this study suggest that most children in Canada are raised in good housing environments. Eighty-five per cent of households with children lived in dwellings that were affordable, were in good repair and had enough bedrooms for the number and mix of household members, or they could have afforded to rent dwellings meeting these standards. However, the other 15% of households with children were in core housing need and they experience problems of affordability, housing disrepair and/or over-crowding. Furthermore, lone-parent households, family households that rented their accommodation and households with children with disabilities or Aboriginal identity were particularly susceptible to living in core housing need.

In 1996, two-parent households spent on average 21% of their income on shelter costs. In contrast, lone-parent households spent 34% of their income for shelter, which is higher than the norm for affordability and fewer of them lived in single-family housing units than in 1976. Households that spend more than the norm for their shelter - in terms of dollar amounts and the proportion of their incomes - are left with less to spend on other areas including food, transportation, recreation, children's clothing, education and reading, and child care. These items in general support healthy child development.

The study also shows that housing disrepair and crowding bear a relationship to child development outcomes. The potential exists for detrimental long-term effects on children raised in crowded dwellings in disrepair. The findings suggest that these children are more at risk of poor health, asthma, poor school performance, aggressive behaviours and trouble with the law. For example, 89% of children in sufficient housing were in excellent health compared to only 72% of children in crowded housing in disrepair, an outcome that underlines the importance of good housing environments for healthy development.

CHILDREN'S ENVIRONMENTS

Prepared by Canadian Council on Social Development. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Distinct Housing Needs Series) 34 pages

Order number: 62209

NOTE 1 : Aussi disponible en français sous le titre : Le logement des enfants au Canada
NOTE 2 : No. 55-4 in the Research Highlights Socio-Economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : CMHC Information Products

HOUSING FORM AND QUALITY IN RELATION TO CHILDREN'S MENTAL HEALTH

This External Research Project (ERP) will examine whether housing form and quality are related to the socio-emotional health of children. It will use standardized measures of housing quality and mental health, two major housing forms (single family and low-rise cluster), and will consider the role of various potentially moderating influences, including socioeconomic status and indoor population density to answer the basic question: "How, if at all, does housing form and quality affect the socio-emotional health of urban Canadian children".

CMHC Project Officer : *Fanis Grammenos* ***CIDN*** : 2437 0200013
Division : External Research Program ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available *** NEW ***

CITY PLANNING AND HUMAN SETTLEMENTS

ASSESSING THE FULL COSTS OF WATER, LIQUID WASTE, ENERGY AND SOLID WASTE INFRASTRUCTURE IN THE FRASER VALLEY REGIONAL DISTRICT

This project was conducted for CMHC by The Sheltair Group Inc. in order to demonstrate the benefits of using full-cost accounting tools and techniques to evaluate the social, economic, and environmental costs and impacts of urban growth. Using the Fraser Valley Regional District (FVRD) in British Columbia as a case study, a two-part project was conducted. The project resulted in the development of a methodology and an associated software tool for compiling and analysing detailed infrastructure profiles, and then using these profiles to assess the full costs of different growth scenarios. The report is organised in two parts: Part 1 provides background information about the FVRD, and presents a methodology specific to the Regional District. Part 2 describes the development of the software tool, and presents results of the application to the FVRD.

Prepared by The Sheltair Group Inc. and the International Centre for Sustainable Cities (Sustainable Cities Foundation). Prepared for: Research Division, Canada Mortgage and Housing Corporation; Planning Department, Fraser Valley Regional District, Growth Strategies Office, Ministry of Municipal Affairs. CMHC Project Officer: Doug Pollard. Ottawa: Canada Mortgage and Housing Corporation, 2000.

NOTE: No. 85 in the Research Highlights Socio-Economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

CONCEPT OF A QUALITY LOCATION AND THE CENTRAL DISTRICTS OF MONTRÉAL

The primary scope of the proposed research will be to develop an approach based on sustainable development and aimed at better evaluating the capacities of an urban area to enhance its living conditions. In so doing, we believe that the proposed approach will support any measures to establish more effective guidelines for the improvement of these capacities.

CMHC Project Officer : *Paul Cardinal*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200008
STATUS : Ongoing
*** NEW ***

IMPLEMENTING THE OUTCOMES OF THE SECOND UNITED NATIONS CONFERENCE ON HUMAN SETTLEMENTS (HABITAT II): CANADA'S RESPONSE = MISE EN OEUVRE DES MESURES ADOPTÉES LORS DE LA DEUXIÈME CONFÉRENCE DES NATIONS UNIES SUR LES ÉTABLISSEMENTS HUMAINS (HABITAT II) : RAPPORT DU CANADA

The Second United Nations Conference on Human Settlements, Habitat II, was held in Istanbul, Turkey in June 1996. Habitat II brought together representatives from 171 countries to discuss an issue of global concern: shelter and human settlements in a rapidly urbanizing world. The countries participating in Habitat II adopted the "Habitat Agenda", a commitment by the world's nations to improve living conditions in the world's cities, towns, and villages.

In June 2001, five years after Habitat II, the General Assembly of the United Nations held a special session, popularly known as Istanbul + 5, to review and appraise implementation of the "Habitat Agenda" worldwide. In preparation for this session, countries were invited to report on implementation of the Agenda. The United Nations Centre for Human Settlements (UNCHS) has developed reporting guidelines for use in the preparation of the national reports.

In response to the UNCHS invitation, Canada has prepared this Country Report, based upon a series of six Technical Reports. Part of this report focuses on qualitative and quantitative data addressing a series of identified indicators. These indicators are intended to measure progress relative to a number of commitments and recommendations in the Habitat Agenda. Canada' s indicators data has been provided, where possible, for Canada as a whole and for each of five major urban areas: Vancouver, Calgary, Toronto, Montreal, and Halifax.

The main body of this report is divided into seven sections: an introductory overview, and six thematic chapters as requested by the UNCHS:

- Overview: The Canadian Approach
- Chapter 1: Shelter
- Chapter 2: Social Development and Eradication of Poverty
- Chapter 3: Environmental Management
- Chapter 4: Economic Development
- Chapter 5: Governance
- Chapter 6: International Cooperation.

Within each chapter, five subsections provide the following information:

- The first subsection addresses the identified indicators for the topic of the chapter.
- The second and third subsections provide an overview of key federal and provincial government initiatives relevant to the topic of the chapter. The information contained in these subsections was obtained via surveys of federal and provincial agencies.
- The fourth subsection summarizes selected municipal/local best practices relating to the topic of the chapter. The examples presented have all been independently evaluated as best practices through the mechanism of the UNCHS Best Practices Program and Database.
- The final subsection is a synthesis of stakeholder views on the topic of the chapter, derived from a series of interviews and reflecting a diversity of viewpoints on a number of key issues.

The Quebec Report was prepared by the Government of Quebec. It reviews the implementation of the Habitat Agenda in Quebec from the provincial perspective, and may be found in the Annex.

Canada Mortgage and Housing Corporation (CMHC) assumed overall responsibility for preparation of this report, with assistance from an Interdepartmental Steering Committee. Marbek Resource Consultants Ltd. undertook all research and writing, with contributions from Greg Lampert, Economic Consultant. Extensive assistance was provided by Statistics Canada and Environment Canada for the indicator data. Many other federal and provincial agencies provided information and input, as did a range of stakeholders. Provinces and territories that contributed to the development of the Country Report include Ontario, Quebec, New Brunswick, Manitoba, British Columbia, Prince Edward Island, Alberta, Saskatchewan, Newfoundland, and Nunavut.

Ottawa: Canada Mortgage and Housing Corporation, 2001. ca 320 pages

Text in English and in French.

Order number: 62321

STATUS : Completed Report

AVAILABILITY : CMHC Information Products and
http://www.cmhc-schl.gc.ca/en/search_results.cfm

REQUALIFICATION OF SUBURBS AND REGULATORY FRAMEWORKS : CURRENT SITUATION

The objectives of this study are, first, to analyze the current regulatory frameworks that could support proposals for the requalification of Quebec suburbs and, second, to propose measures that could be introduced to make it easier for these districts to adapt to the social and physical changes that they are undergoing.

CMHC Project Officer : *Philippe LeGoff*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200018
STATUS : Ongoing
*** NEW ***

CONSUMER PROTECTION

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION

This project's objective is to produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable.

CMHC Project Officer : *Mark Holzman*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1920 0200001
STATUS : Ongoing

CANADIAN HOUSING AND RENEWAL ASSOCIATION RESEARCH PROJECT ON BOARD RENEWAL

Non profit boards have found themselves under increasing strain in recent years, and within the non profit housing sector many boards find themselves in need of renewal and rejuvenation. This project looks at the issues and how boards face the challenges. The study was done in incremental phases involving: a literature search; interviews with boards in other sectors that have undergone board renewal, followed by interviews with non-profit housing boards; and, three case studies of non-profit housing boards experiences.

Experiences, approaches and tools are detailed throughout the body of the report, with Section 6.0 providing a summary of observations, key conclusions, symptoms of board fatigue or dysfunction, preventive action, and available resources.

Prepared by Urban Aspects Consulting Group Ltd. Prepared for Canadian Housing and Renewal Association for Canada Mortgage and Housing Corporation. Ottawa: Canada Mortgage and Housing Corporation, 2000. 55 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

COST OF CO-OPERATIVE HOUSING

The purpose of this project is to conduct a study of the cost of co-operative housing.

CMHC Project Officer : *Graham Murray* — ***CIDN*** : 2439 0501001
Division : Audit and Program Evaluation Services — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available — *** NEW ***

CRISIS SITUATIONS IN COOPERATIVES: INCREASING UNDERSTANDING TO IMPROVE INTERVENTION

This research project concerns crisis situations in housing cooperatives: the conditions in which they emerge, but especially the dynamics put in place to resolve them.

CMHC Project Officer : *Marie Murphy* — ***CIDN*** : 2018 0200001
Division : External Research Program — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

PUBLIC HOUSING TENANT SELF-MANAGEMENT: AN EVALUATION OF THE ALEXANDRA PARK CO-OP CONVERSION PROCESS IN TORONTO

The purpose of this project is to produce an independent review and analysis of the conversion process that has taken place at Alexandra Park/Atkinson Co-op.

CMHC Project Officer : *Vernon Barkwell* — ***CIDN*** : 2305 0200020
Division : Research Division — ***STATUS*** : Planned
AVAILABILITY : Product is not yet available

IMPACT OF THE HOME BUYERS' PLAN ON THE DECISION TO BUY A HOME

This study is aimed at gaining an understanding of the impacts of the Home Buyers' Plan (HBP) on housing demand. It will clarify the following:

- Is the HBP a valid tool to facilitate access to homeownership?
- For which households is the HBP particularly worthwhile?
- What is the financial impact of RRSPs, especially on the issue of the best strategy between reducing mortgage debt or making RRSP contributions?
- If households use the HBP but do not repay their RRSP, will this jeopardize their long-term financial security?

CMHC Project Officer : *Ian Melzer*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200006
STATUS : Ongoing
*** NEW ***

HOMEOWNERSHIP EDUCATION AND COUNSELLING: AN EXAMINATION OF U.S. EXPERIENCE AND ITS RELEVANCE FOR CANADA

The purpose of this research project was to examine the American experience with a view to identifying ways of enhancing affordable, sustainable access to homeownership in Canada. In carrying out the U.S. segment of this research, in addition to conducting a literature review, a survey of homeowner education and counseling (HEC) providers and participants was conducted together with follow-up interviews. For the Canadian portion of the research, a broad range of housing and community organizations (180 in total) were surveyed and follow-up interviews conducted in order to develop a portrait of existing homeownership access support services in Canada.

The first part of the report provides a comprehensive summary and evaluation of the HEC experience in the U.S. Following a synopsis of the historical evolution of HEC, the report outlines the characteristics of HEC programs, services and delivery agencies; responses from HEC industry participants surveyed; how HEC is funded as well as recent developments affecting the HEC industry; specifically the establishment of the American Homeowner Education and Counseling Institute (AHECI), the increased focus on standardizing program content and delivery as well as the certification of HEC providers. Next, the report describes the role that HEC has had in addressing credit, affordability, psychological, cultural and linguistic access barriers to homeownership and is followed with a summary of the statistical studies, research and anecdotal evidence assessing the efficacy of HEC both in facilitating access to homeownership as well as in mitigating mortgage loan default risk. This section of the report concludes by summarizing the results of the US HEC industry expert survey in such areas as: the future of HEC and its key factors of success; why industry leaders are so interested in HEC; and outlines respondents' comments on introducing HEC-type initiatives elsewhere.

The second part of the report examines the access support services and delivery structures existing in Canada to help households access homeownership. It examines information and/or access gaps which indicate the need for enhancing homeowner education and counseling efforts in Canada. The results of a national survey examining the nature, scope and operation of existing homebuyer education and counseling efforts in Canada are then presented followed by an assessment of the differences between what is offered in the U.S. vis-a-vis Canada in addressing access barriers to homeownership. The section of the report concludes by examining whether the gaps in services available in Canada might be filled by introducing HEC-style initiatives that draw on best practices used in the U.S. under the auspices of a housing sector-driven public-private partnership arrangement.

HOME OWNERSHIP

Prepared by Hirshhorn Consulting Inc. and George McCarthy. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David Metzak. Ottawa: CMHC, 2000 (Housing Affordability and Finance Series) (162 pages)

Order number: 62173

NOTE 1: Aussi disponible en français sous le titre : Services de formation et de consultation pour l'accession à la propriété : examen de l'expérience américaine et de sa pertinence pour le Canada (PF 0435)

NOTE 2: No. 68 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight

AVAILABILITY : CMHC Information Products

METHODS USED ABROAD TO SUPPORT ACCESS TO HOMEOWNERSHIP: A RESEARCH SURVEY: FINAL REPORT

This report examines the possibility that one or more measures adapted by governments or industry in other countries in recent years has the potential to improve access to homeownership in Canada. Although every country is, in some respects, unique in the way that housing and accommodation are produced and delivered, there are broad similarities between Canada and a number of other advanced market economies: notably Australia, Britain, France, Germany, New Zealand, and the United States. This report focuses specifically on measures (programs, policies, or practices) employed or contemplated in these six nations over the past decade by governments and the private sector. The report asks whether these measures have the potential to improve access to homeownership in Canada, or extend the benefits of homeownership to under served portions of our population. This report does not consider innovations in residential construction itself (e.g. , land subdivision and planning, construction technology and building codes, or house design) as these are subjects of other studies. This report will be of interest to the construction and renovation industry, the real estate sector, mortgage lenders and insurers as well as public sector housing policy analysts.

Prepared by John R. Miron with contributions by Axel Borsch-Supan, Donald R. Haurin, Patric H. Hendershott, Anne Laferrère, John MacCormick, John N. J. Muellbauer, Marion Steele, and Judith Yates. CMHC Project Officer: David Metzak. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. 147 pages

STATUS : New Completed Report

AVAILABILITY : Canadian Housing Information Centre

HOMELESSNESS

APPLICABILITY OF A CONTINUUM OF CARE MODEL TO ADDRESS HOMELESSNESS

This project will examine the applicability to Canada of a continuum of care (CoC) model by conducting in-depth case studies of the CoC model in four American communities. The project will analyze the benefits and limitations of each CoC program and review its applicability in addressing homelessness in Canadian urban centres.

CMHC Project Officer : *Anna Lenk*

CIDN : 2353 0200001

Division : Research Division

STATUS : Ongoing

AVAILABILITY : Product is not yet available

CHILDREN AND YOUTH IN HOMELESS FAMILIES: SHELTER SPACES AND SERVICES

"Children and Youth in Homeless Families: Shelter Space and Services" provides a snapshot of how local communities across Canada meet the needs of homeless children and youth and their parents or guardians.

This research study involved a review of existing data and literature and two surveys of Canadian shelters. After the first screening survey, the second survey was administered to 112 shelters from large urban areas in most regions of the country.

While the findings may not be statistically representative of geographical regions or type of shelter, they highlight many interesting facts about the homeless children and youth who live in shelters with their families. For example, at the time of the study, over half of the children and youth were under the age of five, and problems with self-esteem and a sense of well-being were common. Not surprisingly, the families who used the shelters had no earned income and many relied on social assistance to meet their everyday needs.

The survey also examined the availability and adequacy of the shelters and their services. Overcrowding was a common problem, while the ability to provide facilities and services such as study areas, indoor and outdoor recreation areas, child care and counseling for children and youth depended on the type of shelter. More family violence shelters than general emergency or municipal shelters provided these facilities and services to their clientele.

The availability of services for parents such as job training, employment searches and on-site medical or legal services was also low in the general emergency shelters but higher in the family violence shelters and municipal programs.

The survey also asks where do homeless families go when they leave the shelters? The results indicate that most moved to their own apartment or house, while a much smaller number moved to another shelter, a rooming house or motel, or stayed with friends or moved to another city. Only a very small percentage lived on the streets.

Most of the families needed financial assistance and affordable housing to ensure a stable household for their children and youth. They also required counseling in life skills, child care and training and employment skills. Different shelters employed various strategies to meet these needs, ranging from home visits and follow-ups to help with budgeting and advocacy.

These are just a few of the insights obtained by this research study. But further research is recommended to provide a comprehensive inventory of the number, size and location of all the shelters serving homeless families with children and youth, and the types of services they provide. Also recommended for further study is an investigation of the health and long-term emotional effects that living in an emergency shelter has on children and youth.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 117 pages

STATUS : Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

NOTE: No. 80 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

ENVIRONMENTAL SCAN ON YOUTH HOMELESSNESS

This report is a comprehensive examination of youth homelessness across Canada. It provides an overview of the homeless youth population, including their shelter situation; the primary housing and support issues related to homeless youth; and the types of effective housing and service interventions that have benefited this need group. It focuses primarily on youth between 16 and 24 years of age, is national in scope and provides detailed information about youth homelessness in every province, the Northwest Territories, Yukon and Nunavut.

The Scan was researched in two steps. The first step was a review of the existing Canadian literature on youth homelessness and the preparation of an annotated bibliography. The second step consisted of interviews with close to 60 key informants across the country, including representatives from all levels of government and front-line community agencies.

The Scan provides an overview of the initiatives to address youth homelessness that are happening at national, provincial or local levels and identifies a number of expanded and additional programs and services that could help alleviate youth homelessness. They include more affordable housing, and a range of additional housing options such as emergency shelters, transition housing and supported housing. There is growing interest in programs that offer youth a full range of housing choices linked with support programs, such as life skills and pre-employment training.

Other suggestions for supporting homeless youth include improved access to income assistance, access to the child welfare system for 16 year olds, more mental health services, treatment for addictions, alternative schooling options and initiatives to help youth find jobs. Family mediation, conflict resolution, strategies to help youth remain in school, more recreation centres, and more support to families and children are also recommended as part of the continuum of supports for helping homeless youth.

Prepared by Deborah Kraus, Margaret Eberle and Luba Serge. CMHC Project Officer: Jim Zamprelli. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001.

NOTE: No. 86 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : New Completed and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

GOVERNANCE IN LOCAL PARTNERSHIPS TO ADDRESS HOMELESSNESS

This research will identify tools and strategies for problem-solving and decision-making within complex partnerships. This will be done by examining methods and structures of collaboration at the local level among community-based agencies and municipal governments, working on homelessness issues, using case studies.

CMHC Project Officer : *Anna Lenk*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2426 0200
STATUS : Ongoing

HOMELESS INDIVIDUALS AND FAMILIES INFORMATION SYSTEM (HIFIS)

In order to help shelters and muncipalities develop useful and comparable information on homeless people, in 1995 CMHC began a program of research to develop the Homeless Individuals and Families Information System (HIFIS) as a user-friendly software application. HIFIS was designed by and for shelters throughout the country to meet their administrative operating requirements while at the same time collecting information that will provide quality data on homeless shelter clients. Municipalities will also benefit greatly from the use of HIFIS. By identifying the number and characteristics of homeless people served in shelters in their jurisdiction, many municipalities will, for the first time, gain a basic understanding of the homeless population in their region. As a result, local governments will be able to better plan, monitor and evaluate policies and programs designed to reduce the problem of homelessness.

In 2000, CMHC pilot tested the software in over 100 shelters in 8 of Canada's largest municipalities located all across Canada. After almost six years of research and development, CMHC has now passed the HIFIS system over to the National Secretariat on Homelessness to take it from being a pilot tested software to being an operational system with support available across Canada. HRDC intends that HIFIS assist local agencies throughout the country.

CMHC Project Officer: *John Engeland* ***CIDN*** : 2295 0200003
Division : Research Division ***STATUS*** : Completed

HOUSING NEEDS OF LOW-INCOME PEOPLE LIVING IN RURAL AREAS

This project is intended to be a preliminary investigation of the housing needs of low-income people living in rural areas, including the existence of homelessness. The methodology includes a statistical profile, mainly from the Census, but supplemented by any surveys which have been done by the provinces/territories and by qualitative research to more finely identify issues affecting very low income or otherwise vulnerable households.

CMHC Project Officer: *Anna Lenk* ***CIDN*** : 2367 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

HOUSING STABILITY AND MENTAL ILLNESS

The objective of this project is to evaluate the effectiveness of programs to promote housing stability for the mentally ill population at risk of homelessness. The research will look at a sample of programs and service providers in order to answer the question of which interventions and which factors most effectively help this population to access and, more importantly, maintain stable housing. Examples of housing-related interventions are supportive housing, residential care, support service agreements with private or social housing landlords, transitional housing, respite care, discharge planning, housing help and mediation services, and crisis response.

CMHC Project Officer: *Anna Lenk* ***CIDN*** : 2290 0200
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

HOMELESSNESS

INVOLVING CLIENTS IN ADDRESSING HOMELESSNESS

This research project will explore and document methods that have successfully involved the homeless and formerly homeless population (including the various sub-populations of homeless people such as families, young people, women, Aboriginal people, persons with disabilities, people with mental illness and addictions, elderly people, refugees, and new immigrants) in:

- assessing their various housing-related needs;
- determining effective housing interventions;
- participating in the development of housing interventions;
- participating in the ongoing management and operation of housing projects; and
- project evaluation.

Project results will form the basis of a how-to guide on methods to involve homeless and formerly homeless people in determining and implementing housing solutions.

CMHC Project Officer : *Jim Zamprelli* — ***CIDN*** : 2395 0200
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

STUDY OF TENANT EXITS FROM HOUSING FOR CHRONICALLY HOMELESS PEOPLE

This project's objective is to study the current residents and the recent evictees from a Toronto agency that has a long history of providing innovative housing and related services for the chronically homeless and 'hard to house'. It is a study of the users of the services provided by the agency, not the agency itself.

CMHC Project Officer : *Anna Lenk* — ***CIDN*** : 2305 0200013
Division : External Research Program — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

** **SEE ALSO:** Innovative Housing for Homeless Youth, p. 129

HOUSE CONSTRUCTION INDUSTRY

HOUSING CONSTRUCTION INDUSTRY: CHALLENGES AND OPPORTUNITIES FOR THE 21ST CENTURY

This research project will examine the evolution of the structure of the housing industry in Canada since the mid-1980s, the industry's current and expected future challenges in the period to 2010, and the ways it might adapt. The study will also identify research issues which merit further investigation and study.

CMHC Project Officer : *Ian Melzer* — ***CIDN*** : 1987 0200001
Division : Research Division — ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

HOUSE CONSTRUCTION INDUSTRY

INDUSTRY PROFILE OF CANADIAN LIGHT STEEL BUILDING

This research will provide an overview of the current Canadian lightweight steel framing industry.

CMHC Project Officer : *Jessica Li* | ***CIDN*** : 2431 0900002
Division : Canadian Housing Export Centre | ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available | *** NEW ***

SKILL SHORTAGES IN THE RESIDENTIAL CONSTRUCTION INDUSTRY

This paper looks at why labour shortages arise and persist, the possible consequences of labour shortages, the tools available to manage labour supply and demand, policy implications and future research requirements.

Rev. edition. Prepared by Morley Gunderson, MKG Associates. CMHC Project Officer: David D'Amour. Ottawa: Canada Mortgage and Housing Corporation, 2001. 125 pages

NOTE: No. 76 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

STUDY ON THE HOUSING SECTOR'S PRODUCTIVITY GROWTH

The objectives of this project are to measure the residential construction sector's productivity, assess the productivity drivers in the sector and, where feasible, by housing type, explain the productivity trends and explain the regional variations.

CMHC Project Officer : *Eric Tsang* | ***CIDN*** : 2406 0100001
Division : Strategic Policy & Planning | ***STATUS*** : Planned
AVAILABILITY : Product is not yet available

**** SEE ALSO:** Technology Dissemination: Triggering Innovation Adoption in Canada's Home Construction Industry, p. 48

HOUSING

HOUSING IN CANADA (HIC) CD-ROM DATA BASE

CMHC has developed an electronic CD data base called Housing In Canada (HIC) which provides housing interest groups with direct hands-on access to comprehensive data on households and housing conditions using CMHC's custom 1996 housing conditions indicators data derived from the 1996 Census and comparing it with data from the 1991 Census. The data base enables groups to have the hands-on capability to examine how and why housing conditions are changing.

HIC presents key demographic and socio-economic data (e.g. household type, income, age, gender and period of immigration) matched to comprehensive housing data (e.g. dwelling type, age and condition; tenure, shelter cost, suitability, affordability and the existence and depth of housing need).

HIC employs today's recognized standards for housing suitability, adequacy and affordability to facilitate the assessment of the state of Canada's housing.

The software profiles most of Canada's households: non-farm, non-Native; non-farm, Native off-reserve; Native on-reserve; and farm households. HIC includes aggregated data for: Census Metropolitan Areas (CMAs) and main sub-divisions (CSDs); Regional Municipalities; residual non-CMA urban and urban areas; and provinces, territories and Canada. The data provided focuses on 1996, but provides comparison data for 1991 to enable users to identify the direction and extent of recent changes in a community's housing.

The bilingual 20/20 software (included) is available in the form of easily manageable CD-ROM disks; for each province and territory, and for each census metropolitan area (CMA). Each provincial/territorial CD-ROM contains Canada level data on it to provide context for all analyses. Similarly, each CMA CD-ROM contains two sets of all CMA average data for comparison; one set for the province in which the CMA is located and the other for all of Canada.

STATUS : Completed

AVAILABILITY : Further information on HIC is available from CMHC's web site: http://www.cmhc-schl.gc.ca/mkrinfo/housingincanada.html

IDENTIFICATION OF GAPS IN DISASTER INFORMATION RELATED TO HOUSING

This short survey project will assemble and review existing housing information related to 'disasters' to assess if and where additional research may be required. The review will concentrate on housing and housing issues, and will be restricted to either Canadian sources or other sources in areas of similar climate or construction techniques. The contractor will assess the suitability of the information for the intended audience and identify gaps in the current consumer information.

CMHC Project Officer : *Don Fugler*

Division : Research Division

AVAILABILITY : Product is not yet available

CIDN : 2417 0200002

STATUS : Ongoing

INTERGENERATIONAL HOUSING TRENDS AND CHALLENGES

This project's objective is to complete an issue paper on intergenerational housing trends and challenges.

CMHC Project Officer : *Leonne Elliott*

Division : Strategic Policy & Planning

AVAILABILITY : Product is not yet available

CIDN : 2409 0100001

STATUS : Planned

HOUSING

SPECIAL STUDIES ON 1996 CENSUS DATA

This project is composed of developing a series of concise studies that explore the housing conditions reported in the 1996 Census of Canada. Seven studies are currently completed and available on the CMHC web site:

- Research Highlights Issue 55-1 Canadian Housing Conditions uses data primarily at the national level, explains commonly used terminology, and examines the largest groupings of households.
- Research Highlights Issue 55-2 Housing Conditions in Metropolitan Areas examines Canada's 25 Census Metropolitan Areas.
- Research Highlights Issue 55-3 Housing Conditions of Immigrants discusses the housing conditions of households whose primary maintainer is an immigrant to Canada.
- Research Highlights Issue 55-4 Housing Canada's Children examines the housing environment of Canada's children.
- Research Highlights Issue 55-5 Changes in Canadian Housing Conditions, 1991-96 examines changes in the housing conditions of non-farm, non-Native households between the 1991 and 1996 Censuses.
- Research Highlights Issue 55-6 Housing Conditions of Native Households examines the housing conditions of households defined as Native using the self-identification definition available in the Census for the first time in 1996.
- Research Highlights Issue 55-7 Canadian Households in core housing need and spending at least half their income on shelter, profiles the characteristics of these Canadian households which in 1996 constituted under 7% of the 9.8 million households studied, or about 38% of the 1.7 million households in core housing need.

Subsequent studies are planned to examine smaller groupings of interest, such as: seniors; people who live alone; families; tenants; women; and young people.

CMHC Project Officer : *Ian Melzer*
Division : Research Division
AVAILABILITY : Research highlight is available

CIDN : 1988 0200003
STATUS : Ongoing

HOUSING AFFORDABILITY

ACT REGIONAL STAKEHOLDER INFORMATION SESSIONS

Ten information sessions will be held across Canada to inform housing stakeholders of regulatory reform solutions that have been generated under the Affordability and Choice Today program. The intent is to encourage replication of these solutions. Stakeholders will include municipalities, home builders, non-profit housing groups and other housing specialists. Forums have been held in Saint John, Halifax, Quebec, Montreal, Toronto, Winnipeg, Saskatoon, Vancouver and Victoria.

CMHC Project Officer : *Susan Fisher*
Division : Research Division
AVAILABILITY : There will be no product for this project

STATUS : Ongoing

F2

AFFORDABLE HOUSING ADVISOR

This project will assemble an electronic database of strategies that have been successfully used to improve housing affordability. These strategies will appear under categories of activity such as: Policy and Regulation; Housing and Community Design; Financing and Tenure; Construction and Technology; Operations and Management; and Redevelopment. Each strategy will be explained and illustrated with two example projects. The database will be accessible through the CMHC web site and will be fully searchable and linked to relevant sources of information of the strategies and examples. The sources will include CMHC reports, publications by other organizations and individuals and web sites of public, non-profit and non-government organizations. This database would be a virtual encyclopedia on affordable housing tools.

CMHC Project Officer : *Fanis Grammenos*
CIDN : 2053 0200004
Division : Research Division
STATUS : Ongoing
AVAILABILITY : Product is not yet available

COCHRANE, ALBERTA, COMMUNITY-BASED AFFORDABLE HOUSING INITIATIVE, PLANNING AND ENGINEERING SERVICES DEPARTMENT, TOWN OF COCHRANE, ALBERTA = INITIATIVE DE LOGEMENTS À PRIX ABORDABLE DE LA VILLE DE COCHRANE (ALBERTA), SERVICE DE L'URBANISME ET DU GÉNIE, VILLE DE COCHRANE (ALBERTA)

The objective of this project was to develop affordable housing policies that could be incorporated into the town of Cochrane, Alberta, Land Use Bylaw and to develop a set of guidelines for implementation of the policies by town planners in conjunction with the development industry.

The Cochrane Town Council amended its Land Use Bylaw to

- allow accessory (secondary) suites and garden suites;
- increase densities in all residential zoning categories;
- to create a new zoning category for multiples taller than four storeys; and the Town Council adopted a replacement Municipal Development Plan that incorporated new policies that addressed requirements for housing choice availability.

By the summer of 1999, Cochrane was seeing positive results from the affordable housing project and the resultant regulatory reforms.

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 48 pages

Order number: 62000

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

GUIDE TO DEVELOPING A MUNICIPAL AFFORDABLE HOUSING STRATEGY

A municipal affordable housing strategy is a systematic approach to addressing local housing issues. It provides the community with an opportunity to discuss housing in its broad social development context and reach a consensus (or at least a widely-supported decision) on what should be done in order to ensure that housing needs are being met. By undertaking a municipal affordable housing strategy, the community can inventory the available resources for dealing with housing issues, weigh the broad range of actions open to them, assign responsibility for action to municipal and community based agencies and identify those actions and policy changes that they will demand from senior levels of government. An affordable housing strategy is developed with public consultation throughout the process.

The purpose of this guidebook is to give municipalities interested in adopting an affordable housing strategy a detailed account of how to go about doing so. The chapters in the Guidebook are arranged along functional lines, meaning that different aspects of the strategy development process are described as separate topics. These functional topics are:

- preparation and administrative set-up
- assess affordable housing needs
- planning and conducting a public participation process
- developing action plans
- implementing the strategy
- building partnerships
- monitoring and evaluation of outcomes

Prepared by Ray Tomalty, Anna Hercz, and Christine Warne. CMHC Project Officer: Fanis Grammenos. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. 85 pages.

STATUS : New Completed Report

AVAILABILITY : Canadian Housing Information Centre

PHILANTHROPIC SUPPORT FOR AFFORDABLE HOUSING: FINAL REPORT

This research project is aimed at providing sponsors of affordable housing with a detailed situational analysis background overview of the philanthropic sector. The study includes an overview of the financial economics associated with producing affordable housing in Canada; an examination of the charitable sector and donor community; and a look at the tax implications of donations to charities and non profit organizations. The report describes the nature, characteristics and regional variations in charitable giving in Canada; sources of charitable donations and funding levels as well as alternative fund raising methods used to solicit financial support. This component of the research also provides an overview of the nature, size and characteristics of the donor community in Canada and presents practical insights into the size, nature, geographic distribution and related factors impacting donations from individual Canadians, the corporate community and foundations. Sixteen case studies are used to illustrate how affordable housing sponsors have been able to obtain philanthropic support for creating affordable housing projects.

Prepared by Manifest Communications Inc. in association with Steve Pomeroy, Focus Consulting and François Lagarde. CMHC Project Officer: David Metzak. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Housing Affordability and Finance Series) ix, 134 pages.

Order Number: 62146

NOTE 1: Aussi disponible en français sous le titre : Appui des organisations philanthropiques à la production de logements abordables (PF 0436)

NOTE 2: No. 67 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

STATUS : Completed Report and Research Highlight

AVAILABILITY : CMHC Information Products

HOUSING AFFORDABILITY

REFINING OF CMHC HOUSING AFFORDABILITY INDICATORS

The purpose of this project is to undertake a study to refine CMHC housing affordability indicators.

CMHC Project Officer : *Louis Trottier*
Division : Market Analysis Centre
AVAILABILITY : Product is not yet available

CIDN : 2320 1000001
STATUS : Ongoing

STATE AND PROVINCIAL AFFORDABLE HOUSING MANDATES AND MEASURES

The objective of this project is to identify and describe affordable housing mandates and measures being used by various states in the U.S. and provinces in Canada which essentially encourage their municipalities to use the regulations associated with the development approval process, but without financial subsidies, to encourage the private sector to provide affordable housing. The final report will be of interest to provincial and municipal planners, housing analysts, finance officers, and third sector housing providers.

CMHC Project Officer : *David A Metzak*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1670 0200003
STATUS : Ongoing

HOUSING AND IMMIGRATION

HOUSING CHOICE AND ADAPTABILITY FOR AFRICAN REFUGEES: THE CANADIAN AFRICAN NEWCOMER AID CENTRE, TORONTO (ONTARIO) = CHOIX ET ADAPTABILITÉ DES LOGEMENTS DESTINÉS AUX RÉFUGIÉS AFRICAINS : THE CANADIAN AFRICAN NEWCOMER AID CENTRE, TORONTO (ONTARIO)

This report describes the work of the Canadian African Newcomer Aid Society of Toronto (CANACT), to develop an adaptable housing model for refugees which would take into consideration the unique needs of refugees, including the changes likely to occur in family size and composition through family reunification. Formally called "Housing Choice and Adaptability for Refugees", the project was undertaken in cooperation with Toronto's Department of Housing and the Department of Planning and Development. The project set out to:

- consult with African refugees to determine their present and future housing needs;
- translate these needs into design guidelines;
- identify regulatory issues relevant to the creation of such housing; and
- acquire land and build a demonstration project of 16 units.

Although the CANACT project never achieved its ultimate goal of actually building homes or developing a viable ownership model, it produced a blueprint that other housing providers can use to develop their own housing projects for new immigrants and refugees. The City of Toronto's study of the zoning implications of CANACT's design guidelines can also be useful to other municipalities as it identifies the kind of permitted use categories needed to accommodate the housing needs of African refugees and newcomers.

HOUSING AND IMMIGRATION

Case study written by: WordWorks Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study)

Order Number: 61993

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

METROPOLIS CENTRES OF EXCELLENCE FOR RESEARCH ON IMMIGRATION ISSUES

CMHC and other federal departments provide ongoing financial support to stimulate and support policy-relevant research on immigration issues, through a network of research centres in Canadian universities. Information on Metropolis and on the almost 200 funded research projects can be found at <canada.metropolis.net>.

CMHC Project Officer : *Thomas Parker*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2224 0200001
STATUS : Ongoing
*** NEW ***

STUDY ON THE RESIDENTIAL INTEGRATION OF IMMIGRANT YOUTH IN MONTRÉAL

The purpose of this project is to study and propose solutions to the problem of integrating immigrant youth in Montréal.

CMHC Project Officer : *Tom F Kerwin*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2316 0200001
STATUS : Ongoing

HOUSING EXPORT OPPORTUNITIES

ASSESSMENT OF PREFABRICATED BUILDING SYSTEMS INDUSTRY

This study will research the prefabricated building industry in Sweden and Finland.

CMHC Project Officer : *Louis Musto*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 1979 0200002
STATUS : Ongoing

CANADA POLAND RESIDENTIAL REAL ESTATE INVESTMENT MODEL: AN EVALUATION OF POLAND'S RESIDENTIAL REAL ESTATE MARKET: SUMMARY

This evaluation of Poland's residential real estate market provides information on the following:

- An economic overview
- Foreign investment regulations
- Residential construction
- The property market
- The legal framework for a housing financing system
- Development prospects
- An Investment model
- Construction permits, the Polish standardization system, and custom duties
- Types of housing systems preferred by Polish consumers
- Business practices and useful contacts.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, 2001. 21 pages.

Note: Publié aussi en français sous le titre : Étude de marché dans le secteur de l'immobilier résidentiel

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

CONTRIBUTION TO A STUDY ON PACIFIC RIM MARKETS FOR TERMITE-RESISTANT WOOD PRODUCTS

The objective of this project is to study the Pacific Rim markets for termite-resistant wood products.

CMHC Project Officer : *Jay Thakar* ***CIDN*** : 2104 0900001
Division : Canadian Housing Export Centre ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

DEVELOPMENT OF A GUIDE TO THE UNITED KINGDOM BUILDING REGULATIONS

The objective of this project is to develop a guide on the building regulations in the United Kingdom.

CMHC Project Officer : *Terry Robinson* ***CIDN*** : 1953 0900
Division : Canadian Housing Export Centre ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

DEVELOPMENT OF AN EXPORT TOOL-KIT FOR CHINA

This project's objective is to prepare a comprehensive assessment and collection of information pertaining to the export of Canadian housing product to China.

CMHC Project Officer : *Murray Rasmussen* ***CIDN*** : 2347 0900001
Division : Canadian Housing Export Centre ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

FACILITATING THE PENETRATION OF CANADIAN COMPANIES INTO THE CHILEAN HOUSING SECTOR: EXECUTIVE SUMMARY

The main purpose of this study is to provide an efficient tool for the penetration of Canadian companies into the Chilean housing sector. This document compiled, analyzed, identified and took note of the best strategies and prospects for successful entry of Canadian prefabricated housing and construction products.

The main objectives of this market study are:

- To describe the Chilean industrialized housing sector
- To identify opportunities for Canadian exporters of these types of housing units
- To identify actual and future real estate development projects where CMHC member companies could participate
- To propose market penetration strategies for each of the main Canadian construction products and the prefab housing sector.

Prepared by Faraggi & Satler S.A. Ottawa: Canada Mortgage and Housing Corporation, 2001. 27 pages

NOTE: Publié aussi en français sous le titre : Favoriser l'implantation des entreprises canadiennes au sein du secteur chilien de l'habitation

STATUS : New Completed Report

AVAILABILTY: Canadian Housing Information Centre and available in PDF file on CMHC's Web site. To download this document visit CMHC's Web site at : http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/repu_012.cfm

HOUSING AND BUILDING MARKET IN CHILE, CHINA, GERMANY, JAPAN, KOREA, POLAND, UNITED KINGDOM

For each of the countries listed above, this report provides the following information:

- quick facts on the country
- characteristics of its housing and building products market
- building technology standards
- building codes and standards
- information on the business environment, domestic and foreign competition, market entry strategies and specific business opportunities
- key contacts, events, references, and internet sources of information.

Prepared for Canada Mortgage and Housing Corporation. Prepared by Department of Foreign Affairs and International Trade. Ottawa: Canada Mortgage and Housing Corporation, 2001.

Publié aussi en français sous le titre : Le marché du logement et de la construction en : Allemagne, Chili, Chine, Corée, Japon, Pologne, Royaume-Uni

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

HOUSING MARKET GUIDES ON FOUR CITIES IN THE UNITED STATES

This project's objective is to prepare individual Market Guides for four cities in the United States: Boston, Chicago, Dallas, and Seattle.

CMHC Project Officer : *Sanjar Farzaneh*
CIDN : 2466 0900001
Division : Canadian Housing Export Centre
STATUS : Ongoing
AVAILABILITY : Product is not yet available

INVESTIGATION OF CO-VENTURES AND EXPORT POTENTIAL FOR BUILDING PRODUCTS AND MATERIALS RELATED TO SUSTAINABLE DEVELOPMENT IN CHINA

The purpose of this project is to explore the opportunities that exist in China for co-ventures and the export of Canadian products, technology and materials related to sustainable development to lower the impact on the natural environment and/or promoting a healthy indoor environment.

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Export Centre

PENETRATION OF THE MULTIPLE HOUSING SECTOR IN THE UNITED STATES

This document is intended to be used as a reference tool by prime contractors and trade contractors alike working in the contractual construction industry and who envision expanding their business into the United States. The purpose of this study is to identify the ten American metropolitan regions that offer the highest potential concerning residential real estate, particularly apartment complexes, and the ten metropolitan regions of the eastern United States that offer the highest potential for non-residential real estate. The study also outlines the methods used by the current exporters to bypass any barriers to entry.

Prepared by Claire Piché and Samir Abboud of COPRIM. Prepared for Canadian Housing Export Centre, Canada Mortgage and Housing Corporation and Association de la construction du Québec. CMHC Project Officer: Carol M. Kerley. Ottawa: CMHC, 2000.

NOTE : Aussi disponible en français sous le titre : Pénétration du secteur de l'habitation multiple aux États-Unis

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre and available in PDF file on CMHC's Web site. To download this document visit CMHC's Web site at :
http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/repu_001.cfm

RESEARCH STUDY ON THE HOUSING MARKET IN THE UNITED KINGDOM

This report describes the housing market in the United Kingdom, providing an overview of the market, statistics on newly built housing, and information on its housing technology. It covers the major challenges facing UK housing and outlines the building technology and standards environment. The final section deals with the key issues concerning imported housing and products to the UK, trading relationships, and recommended market entry strategies for Canadian housing companies. A typical performance specification for timber frame use in the UK is included.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 2000. 52 pages

NOTE : Aussi disponible en français sous le titre : Étude sur le marché de l'habitation au Royaume-Uni

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

STUDY ON U.S. RENOVATION MARKET

This study covers recent changes, trends, and opportunities for the renovation market in the United States. It includes an overview of the market, forecasts and detailed lists of the top American remodeling companies, independent lumber yards and home centres, leading retailing chains, home improvement product retailing headquarters, wholesaling cooperatives, distributors, representatives and agents.

Prepared by The Starr Group Inc. Prepared for Canadian Housing Export Centre, Canada Mortgage and Housing Corporation. CMHC Project Officer: Carol M. Kerley. Ottawa: CMHC, c1999.

NOTE : Aussi disponible en français sous le titre : Étude sur le marché de la renovation aux États-Unis

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

TRENDS AND CHANGES IN JAPANESE BUILDING REGULATIONS

To facilitate the development of export strategies for the Japanese housing market, this report provides information on new government regulation in Japan and the effect of these regulations on imported housing. The report provides an in-depth assessment of the four key issues driving the sweeping changes taking place in Japan's housing industry: Revised Building Standard Law, mandatory 10 year product warranties, Housing Quality Assurance Law (HQAL), and new Government Housing and Loan Corporation (GHLC) criteria.

Prepared by David Cohen and Christopher Gaston. Ottawa: Canada Mortgage and Housing Corporation, c2001. 43 pages.

NOTE : Aussi disponible en français sous le titre : Tendances et changements au niveau des règlements de construction japonais

STATUS : Completed Report
AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 43 page document visit CMHC's Web site at http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/repu_010.cfm

HOUSING EXPORT OPPORTUNITIES

TRENDS IN THE JAPANESE HOUSING MARKET

Japan is one of the world's largest housing markets. Canada is a leading exporter of building materials and services to Japan and has actively promoted the use of Canadian housing systems through a variety of initiatives. Imports of housing, however, comprise only a small proportion of total Japanese housing activity so the potential to expand this market share presents attractive opportunities for Canadian housing producers and suppliers. This report provides:

- an overview of recent trends in the Japanese housing market and housing imports;
- an assessment of market opportunities for Canadian housing companies in Japan; and
- identifies a number of potential market niches including: large-scale wooden buildings; exterior finishes on buildings in quasi-fire protection areas; energy-efficient and healthy housing; housing for the elderly; and the renovation market.

Prepared by Greg Lampert Economic Consultant and Shin Ikehata, Cyber Builders International Inc. Prepared for Canadian Housing Export Centre, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999, c2000. 66 pages

NOTE : Aussi disponible en français sous le titre : Tendances du marché de l'habitation japonais

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre and available in PDF file on CMHC's web site. To download this document visit CMHC's web site at : http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/repu_001.cfm

HOUSING FORECASTING AND DEMAND

DEMOGRAPHIC CHANGES AND REAL HOUSING PRICES IN CANADA

With the aging of the baby-boom generation, the number of young households is falling in Canada. This study examines the contentions of the demographer David Foot, and of earlier work by Mankiw and Weil, that in such a population, the number of home buyers is bound to decrease, causing the prices of residential real estate to drop substantially. In addition to reviewing the relevant economic literature, it constructs econometric models using Canadian national and provincial data and uses them to assess whether expected demographic changes in Canada are likely to trigger a pronounced downward trend in residential real estate prices.The study concludes that even if it is true that demographics may exert downward pressure on real estate prices, such impact will probably be dominant only in certain regions, depending even there on their rates of growth in real income. In other regions, the real price should have a tendency to rise.

Prepared by Mario Fortin and André Leclerc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Ian Melzer. Ottawa: CMHC, 1999, c2000. (Housing Affordability and Finance Series) 142 pages

Order Number: 62152

NOTE 1: Aussi disponible en français sous le titre : Les changements démographiques et le prix réel des logements au Canada

NOTE 2: No. 62 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight

AVAILABILITY : CMHC Information Products

HOUSING FORECASTING AND DEMAND

ESTIMATION OF CORE HOUSING NEED USING THE SURVEY OF HOUSEHOLD SPENDING MICROFILE

This External Research Program project is aimed at developing a methodology for tracking housing conditions and need between censuses using the latest (1999) Survey of Household Spending (SHS) file. The contractor will carry out research at Statistics Canada with the internal SHS working file to examine how to apply CMHC's indicators for housing affordability, adequacy, and suitability and the integrated indicator of core housing need to the SHS. The contractor will, in the process, identify and examine the nature of any problems associated with small SHS sample size, suggesting workarounds where possible, at the same time as evaluating the longer term potential to expand the survey sample.

CMHC Project Officer : *John Engeland*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200016
STATUS : Ongoing
*** NEW ***

HOUSING MARKET

ASSESSMENTS OF EFFECTS OF GRAIN ELEVATOR CLOSURES IN SASKATCHEWAN

This project's objective is to evaluate the effects of closures (and restructuring) of grain elevators recently announced by the Saskatchewan Wheat Pool.

CMHC Project Officer : *Gary MacDonald*
Division : Market Analysis Centre
AVAILABILITY : Product is not yet available

CIDN : 2118 1000001
STATUS : Ongoing
*** NEW ***

IMPACT OF CONVERSIONS OF RENTAL TO OWNERSHIP UNITS ON HOUSING MARKETS IN ONTARIO

This study seeks to generate a framework for addressing the changes in the availability of affordable housing stock in large Ontario cities through conversions of rental units and, by extension to understand the impact of these conversions on other components of the housing market, in particular the new homes market.

CMHC Project Officer : *Alain Miguelez*
Division : Market Analysis Centre
AVAILABILITY : Product is not yet available

CIDN : 2226 1000001
STATUS : Ongoing

ETHNIC CHANGES AND THE HOUSING MARKET IN RIVIÈRE-DES-PRAIRIES, MONTRÉAL

This project's objective is to provide an understanding of the residential building depreciation mechanism in order to find out the share of the effects of ethnicity in relation to the general economic conditions prevailing on the market in Rivière-des-Prairies, Montréal.

CMHC Project Officer : *Philippe LeGoff*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200007
STATUS : Ongoing
*** NEW ***

EVOLVING IMPACT OF E-COMMERCE ON HOUSING FINANCE ACCESS AND AFFORDABILITY: US EXPERIENCE AND LESSONS FOR CANADA

The objective of this research is to examine the significant changes arising in the housing finance market place resulting from e-commerce and their impact on housing finance access and housing affordability. An overview of experience to date and international comparisons with the US will be instructive to Canadian stakeholders and will assist in developing and focusing a program of useful related directed research.

The research project will entail a literature review, Internet searches, interviews and discussions with knowledgeable US and Canadian industry participants, government regulatory agencies, housing sector stakeholders and other key informants.

CMHC Project Officer : *Ian Melzer*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2389
STATUS : Ongoing

LONG-TERM OUTLOOK ON THE DEMAND FOR MORTGAGES IN CANADA: SUMMARY REPORT

Due to slower demographic growth, new housing construction will decline over the next two decades. In addition, because the baby boomer generation is aging, this demographic growth will be concentrated in the older segments of the population. The demand for mortgages will therefore undergo the combined effects of a decrease in the household formation rate and, since the older population is generally wealthier, a better capacity to finance home purchases with equity. This research is aimed at establishing the effects of these demographic changes on the demand for mortgages in Canada. The first part presents a review of the principal known theoretical and empirical results on the demand for mortgages. Then, the determinants of the number of mortgages, their average value and the total outstanding of these loans are studied using an econometric model. Finally, this model is applied to a series of projections to determine the future trends that will affect the Canadian residential mortgage market.

Prepared by Mario Fortin and André Leclerc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Ian Melzer. Ottawa: CMHC, 2000. (Housing Affordability and Finance Series Research Report) 18 pages

Order number: 62275

NOTE 1 : Aussi disponible en français sous le titre : Perspectives à long terme de la demande de prêts hypothécaires au Canada : rapport sommaire

NOTE 2: No. 51 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : CMHC Information Products

NORTHERN HOUSING

EVALUATION OF THE MEASUREMENT OF HOUSING NEED IN NORTHERN AND REMOTE COMMUNITIES

The report evaluates the appropriateness of the current approach - the core housing need concept - for measuring housing need in Canada's northern and remote areas. It also examines other approaches as well as potential enhancements to the existing approach that may result in a better assessment of need in the North. It finds that the ideal measurement approach and data bases to support it would be too costly and that even improvements to the existing approach, to better take into account depth or severity of need, would increase measurement costs. It concludes that although the core need model has its weaknesses, it is as adequate a model as one can achieve to provide regular estimates of need in a cost effective manner.

Prepared by the Institute of Urban Studies. CMHC Project Officer: John Engeland. Prepared for Research Division, Canada Mortgage and Housing Corporation, 1999, c2001. (Housing Affordability and Finance Series Research Report) 95 pages

Order number: 62319

Note: Aussi disponible en français sous le titre : Évaluation de la mesure des besoins de logement dans les collectivités nordiques et éloignées

STATUS : New Completed Report
AVAILABILITY : CMHC Information Products

SEE ALSO: Technical Northern Housing Secion, p. 57-62

PERSONS WITH DISABILITIES

DETERMINING THE EFFORT NEEDED BY ADULTS AND SENIORS TO CLIMB RAMPS USING MANUAL WHEELCHAIRS

This study concerns an analysis of the necessary physical requirements to go up access ramps in manual wheelchairs.

CMHC Project Officer : *Luis Rodriguez*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2305 0200019
STATUS : Ongoing

EXAMINATION OF THE HOUSING CHOICES OF PERSONS WITH DISABILITIES

This project's objective is to have accurate information on the housing choices of people aged 15 and over with mobility and agility disabilities.

CMHC Project Officer : *Thomas Parker*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2144 0200019
STATUS : Ongoing

HOME IS WHERE THEIR WHEELS ARE: THE HOMEMAKING AND HOUSING EXPERIENCES OF MOTHERS WHO USE WHEELCHAIRS FOR FULL-TIME MOBILITY

This project's objectives were to investigate how physically disabled mothers who are full time wheelchair users define, give meaning, and perform household activities within the social and spatial contexts of their homes. Eleven mothers who used wheelchairs for full-time mobility were interviewed concerning the ways in which they had accommodated to or modified their physical and social environments in order to fulfill homemaking and mothering responsibilities. Mothers described social and environmental facilitators and challenges to caring for themselves, their homes and families. Housing accessibility, wheelchair design, and attendant care had effects on their household and caregiving activities and experiences. Further, the manner in which mothers obtained, trained, and used various types of human and mechanical assistance was both a honed skill and sources of significant, and continuous stress. There are implications for care providers, housing planners and wheelchair designers to improve the quality of life for women with disabilities and their families.

Prepared by Denise Reid, Jan Angus, Patricia McKeever, and Karen-Lee Miller. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Tom Parker. Ottawa: CMHC, 2001. (External Research Program Report) ca. 78 pages.

STATUS : New Completed Report

AVAILABILITY : Canadian Housing Information Centre

HOUSING CONDITIONS OF PERSONS WITH HEALTH AND ACTIVITY LIMITATIONS IN CANADA, 1991: A RETROSPECTIVE

This study provides, for the first time, an overall perspective on the general housing conditions of Canadians with health and activity limitations. Being a retrospective, it is based on data from the 1991 Census of Canada linked to the post-censal Health and Activity Limitations Survey (HALS). By comprehensively profiling housing conditions in 1991, the study forms a foundation for work that CMHC plans to do in linking data from the 2001 Census of Canada with the subsequent Health and Activity Limitations Survey.

The conclusions of the study are:

- Persons with disabilities are significantly more likely than other Canadians to be in core housing need, especially those who rent, are moderately or severely disabled, live alone, or are women or single mothers.
- Many need housing adaptations related to their disability but cannot afford them.
- Nonetheless, the great majority are satisfied with their present dwelling. Even most of those seeking change would prefer to adapt their current homes rather than move.

Based on research by Aron Spector, Ark Research Associates for John Engeland, Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, c2000. (Distinct Housing Needs Series Research Report) ix, 24 pages.

Order number: 62026

NOTE 1 : Aussi disponible en français sous le titre : Conditions de logement des personnes aux prises avec des problèmes de santé et des limitations d'activité au Canada, en 1991 : Rétrospective
NOTE 2 : No. 58 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight

AVAILABILITY : CMHC Information Products

PERSONS WITH DISABILITIES

MAJOR MAINTENANCE AND RESIDENTIAL RENOVATION: A SURVEY OF MEANS TO IMPROVE THE ARCHITECTURAL ACCESSIBILITY OF EXISTING BUILDINGS

The objective of this project is to study the extent to which it is possible to integrate architectural accessibility into existing residential buildings during major maintenance or common renovation work planned by an owner.

CMHC Project Officer : *Rachelle Luengas*
Division : External Research Program
Research Division
AVAILABILITY : Product is not yet available

CIDN : 2021 0200001
STATUS : Ongoing

SPACE EFFICIENT UNIVERSAL DESIGN INNOVATIONS

The research will evaluate design innovations which have been developed specifically to enhance access for people who use wheelchairs.

CMHC Project Officer : *Thomas Parker*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2009 0200001
STATUS : Ongoing

POPULATION HEALTH

DEVELOPMENT OF A RESEARCH FRAMEWORK FOR POPULATION HEALTH AND HOUSING

The National Housing Research Committee is interested in the possible links between housing and health status at the population level. This project begins to address the lack of comprehensive research in the area. More specifically, it will summarize what is known using existing literature reviews, recent unreviewed literature, and current work underway. Based on this, the project will: develop a theoretical framework using accepted concepts and definitions where they exist, assess the difficulties of research in this area and identify areas with most promise, assess institutional research capacity for mounting a program of research in this area, and write a research proposal, for submission to a funding body, whereby NHRC could partner.

CMHC Project Officer : *Phil Deacon*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2489 0600001
STATUS : Ongoing
* NEW *

ACTION PLAN FOR REVITALIZING A COMMERCIAL ARTERY: COLLECTIF EN AMÉNAGEMENT URBAIN HOCHELAGA-MAISONNEUVE, MONTRÉAL, QUÉBEC = PLAN D'ACTION POUR LA RVITALISATION D'UNE ARTÈRE COMMERCIALE : COLLECTIF EN AMÉNAGEMENT URBAIN HOCHELAGA-MAISONNEUVE, MONTRÉAL, QUÉBEC

Hochelaga-Maisonneuve is a neighbourhood located in the east end of Montréal, Québec. In the fall of 1996, an umbrella group of local community organizations, the Collectif en aménagement urbain Hochelaga-Maisonneuve, received an A.C.T. grant in order to identify ways to revitalize a once vibrant section of Ste-Catherine Street in the southwestern part of the Hochelaga-Maisonneuve district. The project had three main objectives:

- modify zoning bylaws to encourage neighbourhood revitalization;
- improve the neighbourhood's image by minimizing factors that are driving away investment and people; and
- encourage property owners to participate actively in improving their community.
- Specifically, the project team undertook the following activities:
- updated the study area's land-use maps;
- consulted with municipal housing authorities, local business associations and community groups; and;
- prepared a revitalization plan.

This A.C.T. initiative identified obstacles to revitalization found in the zoning bylaw as well as other factors contributing to the area's decline.

Case study written by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Demonstration Project; ACT Case Study)

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

AUSTRALIAN BUILDING REGULATION AND LIABILITY REFORMS: AN UPDATE

This report builds on, and complements, the 1999 report "Australian Building Regulation and Liability Reforms". It examines the experience of home builders with the new building regulatory system, reviews the regulatory regime being established in the state of Tasmania, and assesses how the information gathered might affect the adoption of similar reforms in Canada.

Prepared by Greg Lampert. Prepared for Canadian Home Builders' Association and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2000. (Healthy Housing and Communities Series) 53 pages

Order number: 62158

NOTE : Aussi disponible en français sous le titre : Réformes de la réglementation australienne de la construction et des dispositions en matière de responsabilité: Le Point

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

BRINGING COMPUTERS INTO THE PERMITTING PROCESS, STRATHCONA COUNTY, ALBERTA = AUTOMATISATION DU PROCESSUS D'ÉMISSION DE PERMIS, STRATHCONA COUNTY (ALBERTA)

This report describes the process followed by Strathcona County to develop a computerized permit processing system and data base, integrated with the existing tax roll and assessment data base. The objective of the project was to reduce red tape and streamline the application and approval process for development and building activities. Results achieved are documented and lessons for other municipalities considering a similar initiative are covered.

Case study written by: Rowena E. Moyes. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 30 pages

Order Number: 61992

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

HOW CAPE BRETON REGIONAL MUNICIPALITY STREAMLINED RESIDENTIAL BUILDING PLANS APPROVALS BY IMPROVING THE QUALITY OF PLANS SUBMITTED FOR REVIEW: FIRE-RESCUE AND BUILDING SERVICES DEPARTMENT OF THE CAPE BRETON REGIONAL MUNICIPALITY, NOVA SCOTIA = COMMENT LA MUNICIPALITÉ RÉGIONALE DU CAP-BRETON A RATIONALISÉ L'APPROBATION DES PLANS DE CONSTRUCTION RÉSIDENTIELLE EN AMÉLIORANT LA QUALITÉ DES PLANS PRÉSENTÉS POUR FINS D'EXAMEN : SERVICES DES INCENDIES ET DU BÂTIMENT DE LA MUNICIPALITÉ RÉGIONALE DU CAP-BRETON, NOUVELLE-ÉCOSSE

This report describes how the Cape Breton Municipality took a different approach to streamlining its residential building permit approval process. Where others focussed on relaxing standards or reorganizing their bureaucracy for greater efficiency, Cape Breton put its emphasis on the front-end of the system. It decided to improve the quality of the plans coming in for review.

The solution adopted by the Region was a training program to teach home builders and their designers how to complete and submit plans that are consistently code correct. Graduates of the course would be certified as "code-qualified" and plans submitted by them would require only a low-level review, meaning they could clear the system faster. For all practical purposes, their plans would arrive pre-approved.

Cape Breton conducted a trial run of its program in 1996 and began full implementation in the 1997 building season. The Region's average processing time for applications from "code-qualified" applicants has dropped to six days compared to an average of 14 days for the non-certified.

The Cape Breton experience can be easily duplicated and other municipalities could expect to reap the same benefits as Cape Breton. Staff would spend less time reviewing building plans and handling permit fee payments at a counter, so they would be free to do other work. The work environment for inspectors would improve because there would be fewer conflicts with builders over code violations.

There are also benefits for builders. They pay less to have their plans reviewed and significantly reduce the possibility of having to make expensive job-site corrections when inspectors spot code violations during construction.

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1998 (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 32 pages

Order Number: 61997

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

HOW THE DISTRICT OF NORTH VANCOUVER BUILT COMMUNITY ACCEPTANCE FOR THE LEGALIZATION OF SECONDARY SUITES IN SINGLE FAMILY NEIGHBOURHOODS = COMMENT LE DISTRICT DE NORTH VANCOUVER EN EST VENU À FAIRE ACCEPTER PAR LA COLLECTIVITÉ LA LÉGISLATION DES APPARTEMENTS ACCESSOIRES DANS LES QUARTIERS CONSTITUÉS DE MAISONS INDIVIDUELLES

This case study describes how the District of North Vancouver built community acceptance for the legalization of secondary suites in single family neighbourhoods. Secondary suites meet a market requirement for low-rent housing, they are a form of urban intensification and they address various needs (mostly financial) of home owners. In spite of these benefits, there is real and perceived community resistance to secondary suites. This opposition is built upon apprehensions that suites adversely affect neighbourhood quality of life and that the people who inhabit them may not be the kind of folks you want living next door. After unsuccessful efforts to close down secondary suites, the municipality decided to try a different approach. The District exposed and deflated the mis-perceptions of residents and suite owners by publishing and promoting four factual documents that:

- profiled owners of secondary suites and their tenants showing how they compared to the rest of the population;
- analysed the cost factors involved in upgrading existing suites to make them building code-compliant, concluding that $10,000 to $15,000 was a typical outlay;
- examined the types of complaints the District received about secondary suites as justification for putting appropriate controls in place; and
- examined the Provincial building code issues involved.

These 4 documents were circulated to builders and developers and to 22 community and ratepayer groups for comment. In addition, the District staged a televised public forum on the issue to obtain input from the public at large. In the end, the District achieved what it wanted -- widespread community acceptance that secondary suites serve genuine needs and therefore deserve a place in the housing mix. The by-law Council passed in October 1997, to legalize secondary suites in single family zones reflected public input. It demands sufficient space for parking, requires that owners live in the home and that there be only one suite per house. District of North Vancouver officials think their experience can benefit other municipalities. The process they used, particularly the research methodology, could be followed by others. Asked what they learned from their experience that could help others, District officials cite three key points:

1. provide the public with factual information based on solid research;
2. find common ground (in this case, consensus focused on health and safety issues); and
3. adopt a non-punitive approach.

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 37 pages

Order number: 61991

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

INCREASING HOUSING IN RURAL COMMUNITY CENTRES, BEAUBASSIN PLANNING COMMISSION, CAP-PELÉ, NEW BRUNSWICK = LA DENSIFICATION RÉSIDENTIELLE DANS LES CENTRES COMMUNAUTAIRES RURAUX, COMMISSION D'AMÉNAGEMENT BEAUBASSIN, CAP-PELÉ (NOUVEAU-BRUNSWICK)

This ACT case study briefly outlines the unrestrained development in rural areas of New Brunswick that was threatening the province's natural resources and creating unsustainable communities. It documents the work of the Beaubassin Planning Commission on behalf of the Beaubassin East Rural Community to examine ways to control sprawl and enhance community life in rural areas. The key to increasing residential density in non-serviced rural areas was to identify alternative ways to treat wastewater in a manner that protects the environment and maintains health standards. The Planning Commission:

- conducted research on innovative types of sewage and storm-water drainage systems
- assessed the feasibility of installing shared or community septic systems to dispose of wastewater; and
- recommended modifications to provincial regulations so as to permit increased densities in non-serviced rural community centres.

As a result of these regulatory changes, property owners in designated community centres can now build a single-family home on a 2000 square metre lot, one-half the previous minimum lot size. The revised zoning bylaw also permits the construction of a second building on a 4,000 square metre lot containing a single-family home. The report outlines how the new zoning regulations enable the Beaubassin East Rural Community to offer a wider range of affordable housing and increase both the speed and flexibility of the development approval process.

Case study written by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 34 pages

Order Number: 61995

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

ONE-STOP APPROVAL FOR MINOR RESIDENTIAL RENOVATIONS, ANDRÉ FORTIN, ARCHITECT, MONTRÉAL, QUEBEC = PROJET D'AUTORISATION INSTANTANÉE POUR LES TRANSFORMATIONS RÉSIDENTIELLES MINEURES, ANDRÉ FORTIN, ARCHITECTE, MONTRÉAL (QUÉBEC)

This report describes the work of André Fortin to improve the permit issuance process for minor residential renovation projects in the City of Montréal. This type of renovation project is frequently undertaken by the property owner without the assistance of a building professional and sometimes without a permit. In doing so, construction safety and quality, and architectural integration are adversely affected. Most homeowners lack the specialized technical knowledge required to prepare the plans and specifications that must be submitted to receive a building permit. Homeowners are often unfamiliar with the approval process, which can be complicated and lengthy, and some find little technical support available to them.

André Fortin, a local architect, was awarded an A.C.T. grant to develop a series of technical guides that help homeowners in the City of Montréal prepare permit applications for minor residential renovations. Separate guides were created for different types of renovation projects such as:

- converting basements to apartments;
- minor additions or interior renovations that would provide additional housing; and
- renovations that make the existing living space accessible to persons with disabilities.

The guides contain sample designs as well as advice on regulations in force and the scope of construction work required. The guides, as well as meetings with municipal staff, provide homeowners with technical support, reduce the documentation required, and speed up the approval process for minor residential renovation projects. This encourages good quality renovation work that complies with existing municipal regulations and reduces administration costs.

The report includes a sample technical guide for building a deck and a sample application form for a basement unit dwelling. The technical guides are a useful reference for all Canadian municipalities using National Building Code regulations.

Case study written by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project; ACT Case Study) 32 pages

Order Number: 61999

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

SURREY'S USE OF INTERACTIVE TOUCH-SCREEN TECHNOLOGY TO EXPEDITE CLIENTS REQUESTS FOR BUILDING PERMIT AND DEVELOPMENT PROCESS INFORMATION: THE CITY OF SURREY PLANNING AND DEVELOPMENT DEPARTMENT = UTILISATION DE LA TECHNOLOGIE INTERACTIVE À ÉCRAN TACTILE PAR LA VILLE DE SURREY AFIN D'ACCÉLÉRER LE TRAITEMENT DES DEMANDES DE PERMIS DE CONSTRUIRE ET D'INFORMATION SUR LE PROCESSUS D'AMÉNAGEMENT : SERVICE D'URBANISME ET D'AMÉNAGEMENT DE LA VILLE DE SURREY

This case study report documents the use of touchscreen and computer technology by the City of Surrey, B.C. so individuals seeking information about land development and building permit policies can serve themselves. The City says its Touchscreen Info-Centre helps streamline permit handling and enhance customer service. Since delays in construction cost money, the kiosks serve the cause of housing affordability by making permit issuance procedures more efficient. The methodology used to create them could be easily emulated by any other municipality.

Case study written by: Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 2000. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study)

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

REGULATORY REFORM

SURVEY OF CANADIAN MUNICIPALITIES: REGULATORY MEASURES FOR HOUSING AFFORDABILITY AND CHOICE

Through a survey of 110 Canadian municipalities, this study collects information on the status of regulatory reforms aimed at increasing housing affordability and choice. The survey also identifies housing-related issues considered to be key priorities by municipalities. The research resulted in a final report and research highlight and will be of interest to municipalities, builders, non-profit housing groups and housing professionals.

Prepared by Spurr Research Associates; CitySpaces Consulting Limited, Lubo Serge et Associés, and Fuller Information. CMHC Project Officer: Susan Fisher. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. ca. 166 pages

NOTE: No. 87 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : New Completed Report and Research Highlight

AVAILABILITY : Canadian Housing Information Centre

RENOVATION AND INSPECTATION

DISINVESTMENT AND THE DECLINE OF URBAN NEIGHBORHOODS

The project aims to develop an understanding of the forces and factors that trigger or accelerate neighborhood decline; create a consensual framework for action that can stem or reverse the housing decline spiral; ascertain the role of investment in housing as a primer for regeneration and identify opportunities for concrete action involving partnerships. Three cities that have experienced inner neighborhood decline and three that have successfully prevented decline are used as the basis for the analysis. Lessons are drawn about strategies or mechanisms that can arrest decline before it becomes a self-reinforcing spiral.

CMHC Project Officer : *Fanis Grammenos*

Division : Research Division

AVAILABILITY : Product is not yet available

CIDN : 2124 0200001

STATUS : Ongoing

RENTAL HOUSING

ANALYSIS OF PENSION AND RRSP INVESTMENTS IN CANADIAN RENTAL HOUSING

This study assesses whether Canadian registered pension plans (RPPs) and retirement savings plans (RRSPs) currently under-invest in rental housing, and if so, whether there are specific obstacles to investment and policy options that would potentially increase investment. The study methodology involves an integrated approach consisting of five elements:

- a review of the legislative and regulatory environment;
- a synthesis of the theoretical and empirical literature on modern portfolio theory;
- a survey of pension funds and money managers;
- a comparative assessment of the Canadian/U.S. environments and results; and
- a quantitative analysis of rental housing investments by RPPs/RRSPs.

The primary focus of the study is on equity investments. The study finds that RPPs/RRSPs hold only minuscule amounts of rental housing investments. The evidence presented indicates that there is substantial scope for increasing RPP/RRSP investment in rental housing, assuming current obstacles can be removed. Any significant boost in the flow of such savings to rental housing could substantially increase equity investments in the sector and potentially lower cost and rents. The study identifies a number of specific obstacles to investment and makes suggestions for improving the investment climate.

Prepared by Alex S. MacNiven. CMHC Project Officer: Ian Melzer. Ottawa: Canada Mortgage and Housing Corporation, 2001 (External Research Program) 183 pages.

NOTE: No. 79 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

ASSESSMENT REPORT ON RENTAL HOUSING TAXATION IN CANADA

The objective of this project is to write an assessment report on rental housing taxation in Canada which will identify all rental housing and related tax provisions; explain how each of these rental housing and related tax operates, including the use of illustrative numerical examples in each and every case; and discuss the generally-accepted criteria and a feasible methodology for determining the appropriateness of the current taxation regime applicable to rental housing.

CMHC Project Officer : *Eric Tsang*
Division : Strategic Policy and Planning
AVAILABILITY : Product is not yet available

CIDN : 2405 0100002
STATUS : Ongoing

INVESTMENT IN RESIDENTIAL RENTAL HOUSING IN CANADA: LESSONS LEARNED FROM STUDIES AND RESEARCH

The objective of this project was to identify the reasons that lead investors to include rental properties in their portfolios. The work consisted of a review of the literature addressing the choice of residential rental properties as investments and the place of such investments within investor portfolios. The consultant therefore had to present the different theories and approaches serving to determine the criteria used by investors.

This review first revealed the lack of reliable data on real estate return. Without such data, the empirical properties of this type of investment, and particularly its diversification effect, cannot be established accurately. The absence of any Canadian studies on this subject is also noted. In spite of these findings, certain studies tend to demonstrate that taxation related to rental housing investments has had a significant impact on the inclusion of such investments in investor portfolios. There is also the strong correlation between real estate return and inflation that may have encouraged investors to include such investments in their portfolios to protect their return against inflation.

Prepared by Mario Fortin. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Benoît Sanscartier. Ottawa: CMHC, 2000, c1996.

NOTE: Issued also in French under the title: Investissement dans le logement locatif résidentiel au Canada : leçons des études et avenues de recherche

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

NON-PAYMENT OF RENTS AND THE HEALTH OF THE RENTAL SECTOR IN QUEBEC

This research will measure the extent and spatial distribution of the non-payment of rents in Quebec and its economic impact on the rental sector; identify the socio-economic and demographic factors that could explain the growth of this phenomenon as observed in the number of actions brought by landlords; analyze the regulations governing the processing of recovery-termination cases in view of improving the current procedures at the Régie du logement.

CMHC Project Officer : *Charles Fortin*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2305 0200018
STATUS : Planned

NON-REGULATORY INTERVENTIONS FOR ROOMING HOUSES/SROS AND TENANTS

This project will document non-regulatory initiatives that have been undertaken in Canada and the US that have had the effect of conserving the rooming house stock and stabilizing tenancies.

CMHC Project Officer : *Anna Lenk*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2432 0200001
STATUS : Ongoing

REGULATORY FACTORS IN THE RETENTION AND EXPANSION OF ROOMING HOUSE STOCK: FINAL REPORT

This study was carried out to develop a comprehensive picture of how rooming houses are regulated across the country and, furthermore, how those regulations have affected the number and type of rooming houses over the years. A review of recent literature, together with profiles of rooming house regulatory practices in 11 major centres across Canada, found:

- that most municipalities follow similar regulatory approaches based on a combination of zoning regulations, maintenance and occupancy standards, building standards, fire-safety standards, public health standards and licensing laws;
- the lack of co-ordination in the application and enforcement of these regulations in many municipalities is creating concerns among operators and other stakeholders in the rooming house sector;
- there is a growing demand for rooming house-type accommodation due to such factors as growth in single person households, increasing homelessness and growing student needs;
- supply factors such as shrinking vacancy rates, escalating rents, long social housing waiting lists and lack of new social housing development are placing growing pressure on the rooming house sector.

The report identifies a number of lessons for effective enforcement and outlines innovative regulatory practices that have been adopted by municipalities such as the City of Edmonton and the City of Winnipeg to reduce regulatory barriers and costs.

Prepared by The Starr Group Inc. in association with Richard Drdla Associates. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2000.

NOTE : No. 48 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : Canadian Housing Information Centre

RENTAL HOUSING

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980S INTO THE 1990S - A RETROSPECTIVE

Between the early 1980s and the mid-1990s, the situation facing renters in Canada changed. The demography of Canada's renter population changed, the economy went through boom, bust and much restructuring, and changes in spending by governments on social programs resulted in many renter households facing difficult choices. This report assembles comparable data on the change in condition of renter households between the early 1980s and mid-1990s. It is based largely on Household and Income, Facilities and Equipment (HIFE) micro-data samples from Statistics Canada.

Prepared by John R. Miron. CMHC Project Officer: John Engeland. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001. 38 pages

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

RESIDENTIAL DEVELOPMENT

COMMUNITY DESIGN: AN ANALYSIS OF DENSITY MEANINGS AND DEVELOPMENT OF A DESIGN TOOL

The study will address how Land Use Density (LUD) stipulations can impact and/or interplay with the various other system components of community plan-making, e.g. open space, schools, retail, etc.

CMHC Project Officer : *Doug Pollard*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 1998 0200001
STATUS : Ongoing

EFFECTS OF DEVELOPMENT CHARGES ON URBAN FORM

The purpose of this research project was to conduct a nation-wide survey of builders and developers to determine the effects of development charges on industry decisions related to residential densities, location and timing. Case studies in selected cities explore in more detail how specific development charge regimes are affecting residential development patterns.

This report looks at the effects of development charges (dc's) on industry decisions related to residential densities, location and timing. The first phase of the work consists of a survey of 1,214 builders and developers; 265 responses were submitted (22%), representing firms ranging in size from 5 to 60 employees. All of the firms are located in urban regions consisting of more than one municipality. Some of the results are presented below:

- Most of the respondents (86%) indicated that differences in development charge fees among the municipalities in their respective urban regions have at least some impact on their regional locational decisions; 32% indicated a major impact.
- Slightly more than 17% of respondents said that they always locate in municipalities with lower dc's, while 69% said that they sometimes favour areas with lower dc's.
- When locating within a municipality where dc's vary by location, 64% of respondents said that "area-specific" charges have a "major" or "medium" impact on their locational decisions; of these, 20.5% "always" located in lower-charge areas, while 63.6% "sometimes" located in lower-charge areas.

- A majority of respondents (54.5%) thought that development charges have a "major" or "medium" impact on their decisions related to lot sizes; of these, 56.5% thought that they tended to decrease lot sizes.
- 31.4% of respondents felt that the dc's in their respective municipalities favour detached houses; 24.4% said they favour attached houses; 18.6% said multiples; 14.0 thought they encourage a mix of houses; and the rest didn't know.

Prepared by Ray Tomalty, Peck & Associates in association with Christine Warne and Pip White of Urban Aspects. Ottawa: Canada Mortgage and Housing Corporation, 2000.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

PRO-HOME: A PROGRESSIVE, PLANNED APPROACH TO AFFORDABLE HOME OWNERSHIP

This study describes an incremental or progressive approach to residential development, the Pro-Home approach, and examines its potential to increase access to affordable home ownership in Canada.

Pro-Home refers to an incremental approach to housing development whereby households enter the market at a level they can afford, and over time, alter or expand their housing in accordance with their financial means and housing needs. Using lessons learned from the unplanned residential developments that took place in Toronto prior to 1950, the Pro-Home proposes a planned and progressive approach to housing development.

This study is organized in the following five parts:

- Part I outlines the context underpinning the Pro-Home concept, namely, the need to introduce new practical solutions to address the growing problem of housing affordability in major urban areas in Canada.
- Part II reviews a number of Canadian and international precedents of owner-built or incremental housing, tracing how progressive approaches to residential development have facilitated access to affordable home ownership and what lessons can be derived from these experiences.
- Part III provides a general description of the Pro-Home concept, illustrating its key features and design elements.
- Part IV presents a detailed application scenario of the Pro-Home approach to housing development, including a cost proforma and analysis of possible constraints to implementation.
- Part V proposes an implementation framework for incremental housing development, focusing on organizational elements such as partnerships, an organizational model and an implementation process.

Prepared by John van Nostrand of Planning Alliance with the assistance of Jill Wigle. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program) vii, 65 pages.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

RESIDENTIAL DEVELOPMENT

PROJECT TO ENCOURAGE TRIPLEX AND QUADRUPLEX HOUSING, CITY OF NANAIMO, BRITISH COLUMBIA = PROJET VISANT À ENCOURAGER LES TRIPLEX ET QUADRUPLEX, VILLE DE NANAIMO (COLOMBIE-BRITANNIQUE)

This case study report describes the work of the City of Nanaimo to expand the opportunities for its growing numbers of lower to moderate income seniors, empty nesters and first time buyers to access affordable housing through the creation of well designed triplex and quadruplex projects. Community representatives, the Nanaimo Home Builders' Association and the Nanaimo Chapter of the Vancouver Island Architects Association participated in this project to provide an alternate form of housing that would fit in with traditional neighbourhoods. The objectives of the project were to:

- bring stakeholders in the housing sector together to design three innovative triplex and quadruplex housing forms;- prepare design guidelines for the development of attractive, affordable, triplex and quadruplex housing; and
- adopt appropriate changes to the Official Community Plan, Zoning Bylaw, Subdivision Guidelines and Multi-family Development Permit Guidelines to allow for this type of housing within single family neighbourhoods.

Case study written by: Rowena E. Moyes. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1998. (Affordability and Choice Today (A.C.T.) Regulatory Reform Project; ACT Case Study) 48 pages

Order Number: 61996

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

RESIDENTIAL DEVELOPMENT IN COASTAL COMMUNITIES: ADDRESSING CLIMATE CHANGE THROUGH SUSTAINABLE COASTAL PLANNING

The objectives of this project are: to understand the relationship between coastal development, climate change and sea level rise; determine the policy and planning context, and stakeholder understanding of climate change and the impact of sea level rise on coastal residential development, in a local case study; and to recommend new development guidelines for coastal residential development to adapt to climate change and sea level rise.

CMHC Project Officer : *Brian Eames*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200012
STATUS : Ongoing
*** NEW ***

SENIORS

EVALUATION OF OPTIMAL BATH GRAB BAR PLACEMENT FOR SENIORS

This project's objective is to assess different locations and configurations of bathtub grab bars and to identify the safest and most useful options to help independent seniors living in the home to maintain their independence and avoid falls.

CMHC Project Officer : *Luis Rodriguez*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2305 0200021
STATUS : Ongoing

HOUSING OPTIONS FOR OLDER CANADIANS: USER SATISFACTION STUDY

The objective of this research was to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

The research included 24 case studies of housing options for older Canadians from across the country. During site visits to each of these housing options, focus groups were held with key stakeholders involved in establishing and operating the projects (planners, managers, owners, service-providers, etc.), a sample of residents participated in "walk and talk" evaluations of their dwelling units, and study staff completed an architectural checklist. Additionally, photos, architectural drawings, brochures and policy manuals were collected from each of the 24 sites and a resident satisfaction survey was distributed.

The report is published in 3 parts:

Part 1 presents the findings from the 24 case studies that were carried out, emphasizing the projects' design characteristics and development process, as well as the residents' level of satisfaction with their housing. The results are grouped under six categories of housing.

Part 2 presents detailed findings from the Resident Satisfaction Survey that was carried out. These are discussed under the following nine headings: Respondent Characteristics, Personal Housing History, Current Housing, Satisfaction with Housing Features, Satisfaction with Tenure Arrangement, Satisfaction with Social Involvement and Interaction, Satisfaction with Management and Operational Approaches, Satisfaction with Support Services and Amenities and Overall Satisfaction with Housing Project.

Part 3 contains the frequency tables from which the data in Parts 1 and 2 reports derived, as well as the various forms, checklists, and research and survey tools that were used to carry out the study.

Prepared by Gloria Gutman, Mary Ann Clarke Scott and Nancy Gnoedinger in collaboration with Danielle Maltais, Luba Serge and David Bruce. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Luis Rodriguez. Ottawa: CMHC, 2001. 3 volumes.

NOTE: No. 83 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight

AVAILABILITY : Canadian Housing Information Centre

IMPROVING QUALITY OF LIFE IN BOARDING HOUSES FOR THE ELDERLY: REGROUPEMENT DES RÉSIDENCES POUR RETRAITÉS DU QUÉBEC, MONTRÉAL, QUÉBEC = AMÉLIORATION DE LA QUALITÉ DE VIE DANS LES RÉSIDENCES POUR PERSONNES ÂGÉES : REGROUPEMENT DES RÉSIDENCES POUR RETRAITÉS DU QUÉBEC, MONTRÉAL, QUÉBEC

In Quebec, as elsewhere in Canada, the growing number of seniors combined with a serious lack of housing has led to the proliferation of small, privately-run residences providing room and board to elderly persons. In many cases, these homes operate without a permit and therefore, without adequate regulatory control over the quality of the accommodation or services provided.

In response to this situation, in December 1993, the City of Châteauguay amended its bylaw to ensure that homes providing room and board to more than two persons meet minimum standards of health and safety. Inspired by the Châteauguay example, the Regroupement des résidences pour retraités du Québec (RRRQ), a provincial organization of seniors' residences, undertook an A*C*T initiative to develop a set of regulatory tools intended for use by Quebec municipalities wishing to improve the quality of life in small boarding houses for elderly people.

This case study report describes the work done in reviewing existing regulatory initiatives in Châteauguay as well as in Laval and Longueuil, which led to the identification of three approaches to improving living conditions in small boarding houses:

- a model bylaw that applies to boarding houses containing fewer than ten rooms for rent;
- a municipal registry of homes that comply with the bylaw; and
- the creation of an ongoing dialogue between the key players, such as the municipality and a CLSC.

Case study written by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: FCM; CHBA; CHRA; CMHC, 1999. (Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project; ACT Case Study)

Order Number: 61998

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

LIFE LEASE OWNERSHIP BY THE ELDERLY OF SUITES WITH CONTINUING CARE SERVICES

The objective of this research is to ascertain what form of regulation(s) would protect consumers while not overregulating the industry.

CMHC Project Officer : *Luis Rodriguez*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200002
STATUS : Ongoing
*** NEW ***

SÉCURITÉ EN CAS D'INCENDIE : PERSONNES À MOBILITÉ RÉDUITE VIVANT EN MILIEU RÉSIDENTIEL RÉGULIER

The primary objective of the project was to identify measures that could increase the level of fire safety for persons with disabilities living in regular residential buildings.

The project concluded that owners of regular residential buildings must become aware of the situation of persons with disabilities who live in their buildings and that they must establish a fire safety plan (FSP) with evacuation strategies that take into account the architectural characteristics of the building, the characteristics and evacuation capacities of the occupants and the intervention capability of the local fire department. The report also provides advice to help owners establish a fire safety plan for their buildings.

Prepared by Sophie Lanctôt, Société Logique inc. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program) 121pages.

STATUS : Completed Report
AVAILABILITY : Canadian Housing Information Centre

SENIORS

SEMINARS ON SENIORS' HOUSING TO THE RESIDENTIAL CONSTRUCTION AND HEALTH CARE SECTORS

This project's objective is to develop and undertake delivery of seminars on seniors' housing to professionals in the Canadian residential and home care sectors. Included in this project will be development of presentation materials, trainer manuals, and communication support materials and organization and implementation of a "Train the Trainers" session and at least 10 seminars.

CMHC Project Officer : *Fran Harding*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2382 0200002
STATUS : Ongoing
*** NEW ***

STUDY OF SPATIAL ORIENTATION IN A RESIDENTIAL COMPLEX FOR SENIORS WITH OR WITHOUT COGNITIVE DISORDERS

The general purpose of this research project is to obtain spatial orientation design criteria that will make it possible to work on the architectural environment of residential complexes for seniors. The analysis concerns three typical residential complexes.

CMHC Project Officer : *Luis Rodriguez*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2144 0200017
STATUS : Ongoing

SOCIAL HOUSING

EVALUATION STUDY OF THE SHELTER ENHANCEMENT PROGRAM: SEP

The objective of this project is to complete an evaluation of the Shelter Enhancement Program.

CMHC Project Officer : *Patricia Streich*
Division : Audit and Program Evaluation Services
AVAILABILITY : Product is not yet available

CIDN : 2258 0500002
STATUS : Ongoing
*** NEW ***

UNDERSTANDING THE ROLE OF MIXED INCOME HOUSING: AN EXAMINATION OF THE HOUSING SITUATION OF MARKET TENANTS LIVING IN SOCIAL HOUSING COMPARED TO MARKET TENANTS LIVING IN PRIVATE RENTAL HOUSING

This study looked at similarities and differences between market tenants living in social housing and market tenants living in private rental housing in Greater Vancouver in order to develop a better understanding of the benefit of having market units in social housing. The study also sought to better understand the housing challenges that families and individuals face in finding housing that meets their needs and that is affordable.

The study findings suggest that access to mixed income housing has helped to provide a certain degree of housing stability to family households with low to moderate incomes and has helped to respond to the specific housing needs of single parent families. With tight rental housing markets in many communities, the lack of new rental housing construction, and the increasing residualization of renter households, it is clear that this housing plays an important role in Canada's housing programs. It is also clear that many tenant households with low to moderate incomes would have fewer and less affordable housing options without this housing.

SOCIAL HOUSING

Prepared by Jason and Lorraine Copas, Community Focus, Vancouver, B.C. CMHC Project Officer: William Lortie. Ottawa: Canada Mortgage and Housing Corporation, 2001. (External Research Program Report)

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

ARDENCRAIG: DOCUMENTATION OF AN URBAN INFILL AND REMODEL PROJECT WITH SUSTAINABILITY FEATURES

Ardencraig is a heritage-style redevelopment project, that was completed in September 2000 by Chesterman Property Group Inc. in Vancouver. Chesterman converted an existing single family residence built in 1910 into four strata-titled townhouse units; three in the converted home and a new coach house in-fill residence on the rear yard. The property is located at 355 West 11th Avenue in the City Hall area of Vancouver.

The vision was to identify and prioritize a wide range of resource conservation, energy conservation and healthy building measures for inclusion in the project. These are design and construction methods that will minimize the impact of the project on the environment, and are generally referred to as "green building" or "sustainable building" approaches. The project is a market experiment and an example of producing high-quality housing through remodeling and infill (adding floor space to an existing property) in an environmentally sustainable way.

This report describes the story of Ardencraig from concept to completion, and details many of the specific decisions made about sustainability features. It also reports on a small market survey done during the marketing and post sales stages of the project.

Prepared by Urban Ecology Design Collaborative; Chesterman Property Group Inc.; and Wave Design + Media Inc. CMHC Project Officer: Brian Eames. Ottawa: Canada Mortgage and Housing Corporation, 2001. (External Research Program Report) 61 pages.

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

FROM THEORY TO PRACTICE: A REVIEW OF PERFORMANCE ASSESSMENT CRITERIA FOR IMPLEMENTING SUSTAINABLE COMMUNITIES

The purpose of this project is to identify and briefly describe a number of performance assessment criteria that are currently being used to operationalize the principles/features/objectives of sustainable community development from Canada, the US and Europe, etc.

CMHC Project Officer : *Doug Pollard*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2305 0200012
STATUS : Ongoing

HEADWATERS PROJECT: EAST CLAYTON NEIGHBOURHOOD CONCEPT PLAN. SOCIO-ECONOMIC RESEARCH HIGHLIGHT; NO. 78

The Headwaters project is a demonstration of sustainable development principles and performance standards in the community of East Clayton, Surrey, BC. Its purpose is to provide a replicable model that can be used to develop more sustainable communities throughout British Columbia's Lower Mainland Region and potentially beyond. This Research Highlight describes the Neighbourhood Concept Plan (NCP) and the planning process. It also examines some anticipated environmental and economic benefits of the NCP, including greenhouse gases from urban travel, impacts on local streams and hydrology, and infrastructure, land and building costs.

Ottawa: Canada Mortgage and Housing Corporation, 2001. 8 pages

Order number: 61170

NOTE: Aussi disponible en français sous le titre : Projet Headwaters - plan conceptuel du quartier d'East Clayton. Le Point en recherche; série socio-économique; no. 78

STATUS : New Completed Research Highlight
AVAILABILITY : Product is available on the web

IMPACT OF HOUSING CHOICES: CONSUMER INFORMATION ON SUSTAINABLE COMMUNITY PLANNING

The purpose of this project is to develop a consumer-oriented information product comparing the impact of various housing choice scenarios, each with different community planning patterns.

CMHC Project Officer : *Susan Fisher*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2280 0200001
STATUS : Ongoing

LANDSCAPE DESIGN AND MAINTENANCE FOR CANADIAN HOMES

The purpose is to develop an updated advisory document on landscape design, construction and maintenance for Canadian homes. CMHC's last advisory document of this nature, entitled Landscape Architectural Design and Maintenance, was published in 1982. While it offers many practical tips and tools which should be emulated, the update will be more oriented toward a consumer audience, place more emphasis on sustainability and build on recent CMHC research in this area. The document will be completed in 2001 and will be of interest to consumers, landscape architects and the landscape industry.

CMHC Project Officer : *Susan Fisher*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2229 0200001
STATUS : Ongoing

MULTIPLE HOUSING FOR COMMUNITY SUSTAINABILITY

To design and build sustainable communities, professionals in the housing industry need to be familiar with the features of sustainability and their potential appeal to the consumer. This report focuses on the factors that make medium density housing sustainable and appealing to certain segments of the market. It provides a detailed account of consumer requirements for medium density housing and gives examples, both existing and new, of how these can be satisfied. It describes clearly which households are likely to choose medium density forms and how to appeal to them with specific features and marketing tactics. A wealth of illustrations make these features clear and connects them to expressed consumer expectations.

This study will become a valuable reference of ideas for developers or planners that seek to intensify land use in cities. The rich material in the report enables developers and municipalities to base the case for medium density housing firmly in consumer preferences and market demand. It gives the ground rules for satisfying consumer expectations and a range of models with which to do it. It promotes greater acceptance of medium density housing and that enable communities to become more sustainable.

Prepared by Quadrangle Architects Limited, Urban Research Associates, Alen Kani Associates, David Redmond and Associates. Prepared for Research Division, Canada Mortgage and Housing Corporation and Natural Resources Canada, Regional Municipality of Ottawa-Carleton. CMHC Project Officer: Fanis Grammenos. Ottawa: CMHC, c2000. (Housing Affordability and Finance Series Research Report) iv, 53 pages

Order number: 62148

NOTE : Aussi disponible en français sous le titre : Logement collectif et la collectivité durable

STATUS : Completed Report
AVAILABILITY : CMHC Information Products

PHASE III - DEVELOPMENT OF A SUSTAINABLE COMMUNITY DESIGN CHARRETTE FOR SOUTH EAST FALSE CREEK, VANCOUVER

This project's objective is to cosponsor a design charrette related to the area of Vancouver known as South East False Creek. The City of Vancouver will develop a generic sustainable community design charrette handbook to help guide further community planning and design efforts.

The handbook will provide a brief overview of sustainable community design charrettes, their purpose, goals and benefits and give guidance on how to decide whether a charrette is appropriate. Topics covered will include, organizational information, communications, logistics, material requirements, time and timing, products, choreography, facilitation, costs etc. The handbook will feature examples of past charrettes, primarily the South East False Creek charrette in Vancouver.

CMHC Project Officer : *Doug Pollard*
Division : Research Division
AVAILABILITY : Product is not yet available

CIDN : 2307 0200001
STATUS : Ongoing
*** NEW ***

SUSTAINABLE BUILT ENVIRONMENTS: A STUDY OF INDUSTRY VIEWS

The objectives of this project are:

- to identify the factors which influence developers to undertake developments with sustainable built environment characteristics. These factors may include the financial pro-forma, regulatory conditions, market demand, ease of financing and community/environmental vision.
- to determine the degree of interest in, knowledge of, and barriers to sustainable built developments that developers have.
- to identify the factors most likely to influence developers towards more sustainable development.
- to assess regional differences in developer attitudes towards projects containing features of sustainable built environments.

CMHC Project Officer : *Doug Pollard*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200017
STATUS : Ongoing
*** NEW ***

SUSTAINABLE COMMUNITY PLANNING AND DEVELOPMENT: PARTICIPATION TOOLS & PRACTICES: FINAL REPORT

This manual is intended to help those who are seeking to involve others in sustainable community planning and development move through the various stages of participatory sustainable community planning smoothly and effectively. Principles, tools, methods and guidelines included in the manual are drawn from a wide range of expertise areas and input from experienced practitioners. Following a brief introduction providing reasons for the manual, a description of the intended audience, an overview of contents and guidance for use, the manual is presented in four main sections.

The first section, "Initiation", focuses on participation in the sustainable community planning context and includes special attention to key participation principles, levels of participation, and the issues and benefits of multi-stakeholder participation in sustainable community planning.

The second section, "Preparation", outlines in detail ten important steps for effective planning, implementation and follow-up. A series of tear-out tips and checklists for this section are provided in an appendix.

Section III, "Participation", presents essential tools and a 'toolkit' for participation in sustainable community planning. The toolkit includes short sheets outlining five general types of participation activity; a toolbox of more than 150 individual tools and methods useful for various activities; and a series of scenario maps which illustrate the ways various tools can be sequenced and how stakeholders can be involved throughout a particular planning process. Tool examples and resources for this section are included in the appendices.

The final wrap-up section of the manual, "Continuation", addresses ways for ensuring ongoing participation in planning, and speaks to the changing roles of planners and citizens in the process.

In sum, the aims of this book are:

- To provide users with a framework for developing an understanding of participation processes and issues; guidance for planning effective and continuous participatory sustainable community planning programs; and tools for undertaking such programs;
- To help shift community planning from one where planners say, "We'll figure it out and do it for you" to one where it is agreed that "We'll work and learn together" to find creative solutions and achieve mutually beneficial outcomes.

Prepared by Fiona S. Crofton, Principal, ORCAD Consulting Group Inc. CMHC Project Officer: Doug Pollard, Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2001.

STATUS : New Completed Report
AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE INTEGRATION OF INFRASTRUCTURE AND BUILDINGS IN MAASTRICHT, THE NETHERLANDS

This project's objective is to conduct and report upon a workshop entitled 'Sustainable Integration of Infrastructure and Buildings in Maastricht, The Netherlands.

CMHC Project Officer : *Doug Pollard* ***CIDN*** : 2310 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : There will be no product for this project *** NEW ***

TESTING CONSUMER RECEPTIVITY TO SUSTAINABLE COMMUNITY DESIGN FOR A DEMONSTRATION BUILD SITE IN OKOTOKS, ALBERTA

CMHC contribution to develop a computer-based visualization tool that will illustrate and describe the features of a 144-acre demonstration project that adopts sustainable community principles and planning criteria.

CMHC Project Officer : *Susan Fisher* ***CIDN*** : 2363 0200001
Division : Research Division ***STATUS*** : Ongoing
AVAILABILITY : Product is not yet available

YOUR NEXT MOVE: CHOOSING A NEIGHBOURHOOD WITH SUSTAINABLE FEATURES

If you are considering a move, this guide will help you identify neighbourhood features that benefit you and the environment. You will learn about the features, like close access to shopping and jobs as well as see examples from real neighbourhoods across Canada. When searching for your next home, use the checklist to compare neighbourhoods.

Ottawa: Canada Mortgage and Housing Corporation, 2001. 8 pages

Order Number: 62180

Note: Aussi disponible en français sous le title : Lors de votre prochain déménagement : choisissez un quartier comportant des caractéristiques durables

STATUS : Completed Report
AVAILABILITY : CMHC Information Products. Also available on the Internet: http://www.cmhc-schl.gc.ca/en/bureho/buho/buho_003.cfm

**** SEE ALSO:** p. 67-70

GREENHOUSE GAS EMISSIONS FROM URBAN TRAVEL: TOOL FOR EVALUATING NEIGHBOURHOOD SUSTAINABILITY

The purpose of this study is to develop a tool that calculates greenhouse gas (GHG) emissions from personal urban transportation (i.e. cars and public transit) given variations in neighbourhood planning and design variables such as density and land use mix, as well as demographic and locational variables. The Research Report includes a software tool that can be used to evaluate neighbourhood development proposals for GHG emissions from urban travel. In the study, the software is used to compare the GHGs from urban travel of nine neighbourhood scenarios, each with different design features and locational variables.

The results of the evaluation of the nine neighbourhood scenarios using the model developed in this study suggest that the "macro" urban structure is more important than the "micro" neighbourhood design in reducing GHG emissions from auto and transit travel by neighbourhood residents. That is, infill development is more effective than greenfield development in moderating the growth of GHG emissions, even if the new greenfield neighbourhood is neo-traditional rather than typical suburban in design. However, neighbourhood design is also a significant determinant of GHG emissions and can go a long way in improving the sustainability of neighbourhoods in the outer regions of urban areas.

The spreadsheet tool produced by this study provides a useful instrument for planners and developers in comparing the GHG emissions of different neighbourhood scenarios. It enables them to compare the implications of both local neighourhood design and the broader-scale urban structure considerations of infill versus greenfield development.

Prepared by IBI Group for Canada Mortgage and Housing Corporation and Natural Resources Canada. CMHC Project Officer: Susan Fisher. Ottawa: CMHC, 2000. (Healthy Housing and Communities Series) ix, 60 pages.

Order Number: 62142

NOTE 1 : Aussi disponible en français sous le titre : Émissions de gaz à effet de serre attribuables aux déplacements urbains
NOTE 2 : No. 50 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

STATUS : Completed Report and Research Highlight
AVAILABILITY : CMHC Information Products

REGIONAL ROAD CORRIDOR DESIGN GUIDELINES. SOCIO-ECONOMIC RESEARCH HIGHLIGHT; NO. 52

This document addresses the function and design of regional arterial roads and adjacent lands in the urban areas and villages of the former Region of Ottawa-Carleton (now the City of Ottawa). It provides design guidelines that integrate traditional objectives like safety and efficiency of vehicular movement with safe, pleasant and convenient movement of pedestrians, cyclists, and transit users. The document crosses traditional boundaries between land use and transportation planning by including the road right-of-way (ROW) and its interface with adjacent land uses, right up to building facades. While the guidelines were developed specifically by the former Region of Ottawa-Carleton, they could also apply to similar municipalities across Canada.

Ottawa: Canada Mortgage and Housing Corporation, 2001. 6 pages

NOTE : Aussi disponible en français sous le titre : Lignes directrices en matière de conception des corridors de routes régionales. Point en recherche : série socio-économique; no. 52

STATUS : Completed Research Highlight
AVAILABILITY : Canadian Housing Information Centre and available on the Internet at: http://www.cmhc-schl.gc.ca/publications/en/rh-pr/main_en.html

WOMEN AND HOUSING

HOUSING OPTIONS FOR RURAL WOMEN LIVING ALONE

This project's objectives are: to identify the unique housing requirements of women living alone in rural areas, the housing options that would meet these requirements, changes required to planning practices and land use regulations that would allow the housing sector to respond to the unique housing requirements of women living alone while respecting the density issues, environmental issues and other factors essential for the preservation of the rural character of life.

CMHC Project Officer : *Anna Lenk*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2437 0200004
STATUS : Ongoing
*** NEW ***

YOUTH AND HOUSING

INNOVATIVE HOUSING FOR HOMELESS YOUTH

The purpose of this project is to research and identify the innovative aspects of housing for homeless youth in terms of architecture, management and support services and to identify what makes a project exceptional and successful.

CMHC Project Officer : *Anna Lenk*
Division : External Research Program
AVAILABILITY : Product is not yet available

CIDN : 2305 0200001
STATUS : Ongoing

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